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BUREAU OF FISHERIES
CHARLES E. JACKSON, Acting Commissioner

Administrative Report No. 36

ALASKA FISHERY AND FUR-SEAL INDUSTRIES IN 1938

By WARD T. BOWER

APPENDIX II TO REPORT OF COMMISSIONER OF FISHERIES
FOR THE FISCAL YEAR 1939

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ADMINISTRATIVE REPORT SERIES

Since the beginning of the Administrative Report Series, considerable confusion has arisen concerning the system of numbering the separates composing it. Inasmuch as the Reports of the Divisions vary in order from year to year, many have found their designations as "Appendix No. I, II, III, or IV" very confusing. To relieve this, it has been decided to number them as "Administrative Report No. —." Inasmuch as 20 separates had already been printed in this series before starting the numbers, it was deemed advisable to begin the numbering with Administrative Report No. 21. Of course, numbers cannot be printed on those already off the press, but for the information of those who wish to know what the first 25 were, they are numbered for filing purposes as follows:

No. 1. Report, Commissioner of Fisheries, 1931.
No. 2. Alaska Fishery and Fur-Seal Industries, 1930.
No. 3. Fishery Industries of the United States, 1930.
No. 4. Progress in Biological Inquiries, 1930.
No. 5. Propagation and Distribution of Food Fishes, 1931.
No. 6. Report, Commissioner of Fisheries, 1932.
No. 7. Alaska Fishery and Fur-Seal Industries, 1931.
No. 8. Fishery Industries of the United States, 1931.
No. 9. Progress in Biological Inquiries, 1931.
No. 10. Propagation and Distribution of Food Fishes, 1932.
No. 11. Alaska Fishery and Fur-Seal Industries, 1932.
No. 12. Progress in Biological Inquiries, 1932.
No. 13. Fishery Industries of the United States, 1932.
No. 14. Propagation and Distribution of Food Fishes, 1933.
No. 15. Fishery Industries of the United States, 1933.
No. 16. Alaska Fishery and Fur-Seal Industries, 1933.
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No. 19. Alaska Fishery and Fur-Seal Industries, 1934.
No. 20. Fishery Industries of the United States, 1934.
No. 21. Progress in Biological Inquiries, 1934.
No. 22. Propagation and Distribution of Food Fishes, 1935.
No. 23. Alaska Fishery and Fur-Seal Industries, 1935.
No. 24. Fishery Industries of the United States, 1935.
No. 25. Propagation and Distribution of Food Fishes, 1936.

Note that the last Commissioner's Report was for 1932. Since then its place has been taken by a reprint from the Report of the Secretary of Commerce under the title "Bureau of Fisheries." Inasmuch as it is no longer a Bureau publication, it is not numbered; but it will be supplied to any who request the Report of the Commissioner for any year since 1932.

ALASKA FISHERY AND FUR-SEAL INDUSTRIES IN 1938[1]

By WARD T. BOWER, *Chief, Division of Alaska Fisheries*

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[1] Administrative Report No. 36, Appendix II to the Report of the U. S. Commissioner of Fisheries for 1939. Approved for publication June 24, 1939.

INTRODUCTION

The Bureau's work in Alaska, which pertains primarily to fishery and fur-seal management, was continued in accordance with the usual plan. The Commissioner of Fisheries spent several weeks in the Territory in July, inspecting both branches of the service.

Regulations for the protection of the fisheries were revised early in the year to meet conservation requirements in various localities, and few additional restrictions were necessary during the progress of the season. In certain places where the salmon runs were late and sufficiently large to assure more than an ample escapement for seeding purposes, the regulations were relaxed to permit from 1 to 4 days additional fishing. Although somewhat below the record output for 1936, the yield of salmon in Alaska in 1938 was well above average.

Weirs for counting the escapement of brood fish were operated in 11 representative salmon streams as a means of determining the ratio of escape to catch. Observations were made also of the numbers of breeding salmon in various important streams where no weirs were maintained.

Under the authorization granted by the Act of August 2, 1937, for the protection of oyster culture in Alaska, two applications were made for lease of bottoms in Territorial waters of southeast Alaska for the bona fide cultivation of oysters. The leasing of such bottoms is on liberal terms, with a view to encouraging the development of this industry.

A patrol of the fishing grounds was maintained by the Bureau's 14 vessels, 5 speed boats, and 14 other small power boats, supplemented by a number of chartered boats and launches. Some use was made also of chartered airplane service, both for patrol and for investigational work. There were 134 persons employed for varying periods as stream guards and special workmen in connection with the enforcement of the fishery laws and regulations, in addition to the regular personnel of approximately 60 persons, principally wardens and vessel operators.

Incidental to fishery-patrol duties, attention was given to the clearing of salmon streams in order to make additional spawning areas accessible for seeding. The improvement of conditions for the natural propagation of salmon involved also the destruction of predatory trout that feed upon salmon eggs and fry. This work was carried on chiefly in the Bristol Bay and Cook Inlet regions, through funds contributed by the Territorial legislature and the salmon packers.

Biological studies of salmon, herring, and trout were continued. The studies of the salmon this season were extended to include a comprehensive investigation of the red salmon of the Bristol Bay area.

No change was made in the regulations for the protection of walruses and sea lions.

There were 58,364 fur-seal skins taken on the Pribilof Islands, an increase of 3,184 over the number obtained in the preceding year. Computations of the fur-seal herd as of August 10, 1938, showed a

total of 1,872,438 animals, as compared with 1,839,119 in 1937. Killings were from surplus male seals, chiefly 3-year-olds, provision being made for a sufficient breeding reserve. The feeding and management of blue foxes on the islands were continued. During the 1938–39 season 1,029 fox pelts were obtained, and a suitable number of animals were marked and reserved for breeding stock.

The operation of the byproducts plant at St. Paul Island for the utilization of fur-seal carcasses resulted in an output of 30,587 gallons of oil and 178½ tons of meal. Except for limited quantities retained at the islands, these products were shipped to Seattle, where the oil was sold for commercial purposes, and the meal was turned over to the Division of Fish Culture for use as fish food at the hatcheries.

A few additional buildings for the natives and the fur-seal industry were constructed at the Pribilof Islands, and improved roads between the curing stations and hauling grounds were repaired and extended. Some new structures and equipment were added to the substation for sea-otter patrol in the western Aleutians.

Through the courtesy of the Navy Department the U. S. S. *Vega* transported the annual shipment of supplies from Seattle to the Pribilof Islands and brought out the season's take of fur-seal skins on the return trip. The Coast Guard again rendered valuable assistance in maintaining a patrol for the protection of the fur-seal herd and in performing other service.

Acknowledgment is made of the assistance by members of the Bureau's staff in the preparation of this document.

VISIT OF COMMISSIONER OF FISHERIES AND OTHER OFFICIALS TO ALASKA

The Commissioner of Fisheries sailed from Seattle aboard the *Brant* on July 2 to inspect the Bureau's fishery and fur-seal activities in Alaska. The party accompanying the Commissioner on this trip included Congressman Millard F. Caldwell, member of the House Appropriations Committee, Dr. Ernest H. Gruening, Director, Division of Territories and Island Possessions, and Mr. John B. McColl, chairman of the fisheries committee of the California State Senate.

The Commissioner's party arrived at Cordova on July 9, after stopping en route at various points in southeast Alaska. From Cordova the trip was continued by airplane to Anchorage and the Matanuska colony and thence to Naknek. At this point the party boarded the Coast Guard cutter *Ingham* and proceeded to St. Paul and St. George Islands to observe the fur-sealing operations there. The Commissioner had planned to return to Seattle aboard the *Brant*, following his visit to the Pribilof Islands, but owing to an accident to that vessel at Kodiak on July 15, the Commissioner's party completed the return trip on the *Ingham*, arriving in Seattle on July 22.

Ward T. Bower, Chief of the Division of Alaska Fisheries, represented the Department on the special fisheries cruise of the Coast Guard cutter *Ingham*, sailing from Seattle on June 24 and returning on July 22. Calls were made at many of the fishing centers and at several Bureau stations en route to Bristol Bay and return. Senator Robert R. Reynolds, of North Carolina, was to have made the trip aboard the *Ingham* but was unable to leave Washington at that time.

Later in the summer, however, Senator Reynolds proceeded to Alaska, and called at St. Paul Island when the Coast Guard cutter *Northland* stopped there on July 28.

Seton H. Thompson, Assistant Chief of the Division of Alaska Fisheries, departed from Seattle aboard the *Penguin* on June 11 to study the fur-seal industry at the Pribilof Islands and to inspect the Bureau's fisheries activities in other sections of Alaska. Following extensive observations at St. Paul Island, Mr. Thompson paid particular attention to the fisheries of Bristol Bay, Cook Inlet, and Prince William Sound before returning to Seattle on August 14 aboard the *Penguin*. Harold B. Carr, Editor and Photographer of the Bureau, accompanied Mr. Thompson to St. Paul Island to obtain official pictures of fur-sealing operations. He returned to Seattle with the Commissioner's party aboard the *Ingham*.

JAPANESE VESSELS IN BERING SEA

In the spring of 1938 assurances were given by the Japanese Government that it would suspend the official survey of salmon resources in the waters of Bristol Bay which it had begun 2 years previously, and that it would continue to suspend the issuance of licenses for vessels to fish for salmon in those waters. This disposition of the matter was arranged after prolonged diplomatic negotiations between the countries involved, inasmuch as the expansion of Japanese activities with respect to the salmon fishery had alarmed Bristol Bay packers, and strong protests had been made against the threatened encroachment on Alaska salmon fisheries.

Only one Japanese crab cannery, the *Toten Maru* (2,951 tons), was operated in Bristol Bay in 1938. It was accompanied by 3 50-foot trawlers and 10 launches about 30 feet long, and left the district before the salmon runs began. Thus there was no interference with the salmon fishery in this region.

The scouting ship *Hakuho Maru*, of the Department of Agriculture and Forestry, cruised in the vicinity of the Aleutian Islands the latter part of May for the purpose of investigating the migration route of fur seals. The vessel was reported as having arrived at Atka from the westward on May 29 and departed for Japan on June 1, owing to engine trouble.

FISHERY INDUSTRIES

As in corresponding reports for previous years, the Territory of Alaska is here considered in the three coastal geographic sections generally recognized, as follows: (1) Southeast Alaska—embracing all that narrow strip of mainland and the numerous adjacent islands from Portland Canal northwestward to and including Yakutat Bay; (2) central Alaska—the region on the Pacific from Yakutat Bay westward, including Prince William Sound, Cook Inlet, and the southern coast of Alaska Peninsula, to Unimak Pass; and (3) western Alaska—the north shore of the Alaska Peninsula, including the Aleutian Islands westward from Unimak Pass, Bristol Bay, and the Kuskokwim and Yukon Rivers. These divisions are solely for statistical purposes and do not coincide with areas established in departmental regulations.

Detailed reports and statistical tables dealing with the various fishery industries are presented herewith, and there are also given the

important features of certain subjects of special investigation or inquiry.

ALASKA FISHERIES LEGISLATION

Under date of April 7, 1938, the President approved an act amending the Act of August 14, 1937, which prohibited commercial salmon fishing by means of stake or set nets in the Bristol Bay area except by persons having resided continuously for a period of at least 5 years within a radius of 30 miles of the place of set-netting. The new act permits such fishing by persons residing continuously within the said area for a period of 2 years and, in the 1938 season, by persons residing there continuously after June 1, 1937.

The Act of June 14, 1906, entitled "An act to prevent aliens from fishing in the waters of Alaska," was amended by an act approved by the President on June 25, 1938, whereby all fishing in Alaska is limited to citizens of the United States, or to persons owing allegiance thereto, and to certain residents of the Territory. Under this act only the following persons may fish in the waters of Alaska:

1. Citizens of the United States.
2. Bona fide residents of the United States who have declared their intention to become citizens of the United States.
3. Natives of Alaska.
4. Aliens owing allegiance to the United States, i. e., Filipinos.
5. Bona fide residents of Alaska who have been residents for a period of three consecutive years prior to June 25, 1938, and who since June 25, 1935, have been continuously or seasonally engaged in commercial fishing in Alaskan waters. Aliens in this category, however, may continue to fish only until June 25, 1941, unless in the meantime they declare their intention to become citizens of the United States.

The text of the amendments is as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Public Law Numbered 282, Seventy-fifth Congress, entitled "An Act making further provision for the fisheries of Alaska," approved August 14, 1937 (50 Stat. 639), is amended to read as follows: "That section 1 of the Act approved June 6, 1924, entitled 'An Act for the protection of the fisheries of Alaska, and for other purposes' (43 Stat. 464), as amended, is further amended by inserting in said section at the end of the first proviso thereof another proviso to read as follows: '*Provided further*, That in the area embracing Bristol Bay and the arms and tributaries thereof, no person shall at any time fish for or take salmon with a stake net or set net, for commercial purposes, unless such person shall be a citizen of the United States and shall have theretofore continuously resided for the period of at least two years within said area; but for the salmon fishing season of 1938, residence within said area continuously after June 1, 1937, shall be deemed sufficient compliance with the residence requirements of this proviso:' "

Approved, April 7, 1938.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 1 of the Act of Congress approved June 14, 1906 (34 Stat. 263), entitled "An Act to prevent aliens from fishing in the waters of Alaska", is amended to read as follows:

"That it shall be unlawful for any person not a citizen of the United States, or who has declared his intention to become a citizen of the United States, and is not a bona fide resident therein, or for any company, corporation, or association not organized or authorized to transact business under the laws of any State, Territory, or district thereof, or for any person not a native of Alaska, to catch or kill, or attempt to catch or kill, except with rod, spear, or gaff, any fish of any kind or species whatsoever in any of the waters of Alaska under the jurisdiction of the United States: *Provided, however*, That nothing contained in this Act shall prevent those lawfully taking fish in the said waters from selling the

same, fresh or cured, in Alaska or in Alaskan waters, to any alien person, company, or vessel then being lawfully in said waters: *Provided further*, That nothing contained in this Act shall prevent any person, firm, corporation, or association lawfully entitled to fish in the waters of Alaska from employing as laborers any aliens who can now be lawfully employed under the existing laws of the United States, either at stated wages or by piecework, or both, in connection with the canning, salting, or otherwise preserving of fish: *Provided further*, That any person owing allegiance to the United States shall not be considered an alien for the purpose of this Act: *And provided further*, That any person who is a bona fide resident of Alaska and has been such a resident for the period of three consecutive years prior to the date of approval of this Act, and who during such three-year period has been continuously or seasonally engaged in fishing in the waters of Alaska for commercial purposes, may continue to engage in fishing in the waters of Alaska for commercial purposes for the period of three years after the date of the approval of this Act, although not a citizen of the United States."

Approved, June 25, 1938.

NEW FISHERY REGULATIONS

The regulations for the protection of the fisheries of Alaska, issued February 15, 1938, were amended by the following regulations issued by the Secretary of Commerce under the dates indicated:

[*April 27, 1938*]

SOUTHEASTERN ALASKA AREA

SUMNER STRAIT DISTRICT

Salmon fishery.—1. Regulation No. 15 (d) is amended to read as follows: Kosciusko Island: West coast within 1,500 feet of a point at 55 degrees 55 minutes 56 seconds north latitude, 133 degrees 48 minutes 22 seconds west longitude.

2. Regulation No. 15 (m) is amended to read as follows: (1) Prince of Wales Island: North coast within 3,000 feet westerly of Point Colpoys; and (2) within 1,500 feet of a point on an unnamed island at the entrance to Port Protection, at 56 degrees 26 minutes 41 seconds north latitude, 133 degrees 38 minutes 4 seconds west longitude.

[*June 7, 1938*]

KODIAK AREA

Herring fishery.—Regulation No. 3 prohibiting commercial fishing for herring from 6 o'clock antemeridian of Saturday of each week until 6 o'clock postmeridian of the Sunday following is rescinded.

PRINCE WILLIAM SOUND AREA

Herring fishery.—Regulation No. 2 prohibiting commercial fishing for herring from 6 o'clock antemeridian of Saturday of each week until 6 o'clock postmeridian of the Sunday following is rescinded.

SOUTHEASTERN ALASKA AREA

SUMNER STRAIT DISTRICT

Salmon fishery.—Regulation No. 2 (2) of supplement No. 251–24–1 issued on April 27, 1938, is amended to read as follows: Within 1,500 feet of a point on an unnamed island at the entrance to Port Protection, at 56 degrees 20 minutes 41 seconds north latitude, 133 degrees 38 minutes 4 seconds west longitude.

CLARENCE STRAIT DISTRICT

Salmon fishery.—Regulation No. 15 (m) (3) is amended to read as follows: The Bronaugh Islands south of 55 degrees 7 minutes 10 seconds north latitude and west of 131 degrees 43 minutes 30 seconds west longitude.

[*July 21, 1938*]

BRISTOL BAY AREA

Salmon fishery.—Regulation No. 13 is amended to read as follows: Commercial fishing for salmon in the Ugashik district with nets less than 8½ inches stretched measure between knots is prohibited except in the period from 6 o'clock antemeridian June 30 to 6 o'clock antemeridian August 1.

[*August 4, 1938*]

PRINCE WILLIAM SOUND AREA

Salmon fishery.—Regulation No. 10 is amended to read as follows: Commercial fishing for salmon is prohibited during the remainder of each calendar year after 6 o'clock postmeridian August 9: *Provided,* That this prohibition shall not apply (a) to trolling and gill netting through August 22 in the waters along the western coast from the outer point on the north shore of Granite Bay (known as Granite Bay Point) to the light on the south shore of the entrance to Port Nellie Juan, and (b) to trolling in the period from 6 o'clock antemeridian August 9 to 6 o'clock postmeridian September 20 in the waters of Prince William Sound east of 147 degrees west longitude, exclusive of all waters of Valdez Arm north of Point Freemantle. All trap leads from shore to entrance of hearts must be removed prior to 6 o'clock antemeridian August 13.

[*August 15, 1938*]

SOUTHEASTERN ALASKA AREA

EASTERN AND WESTERN DISTRICTS

Salmon fishery.—Alaska general regulation No. 1 is hereby amended so as to permit the holding of salmon in traps in the Eastern and Western districts of the Southeastern Alaska area 72 hours after the termination of the fishing season.

[*August 18, 1938*]

SOUTHEASTERN ALASKA AREA

EASTERN DISTRICT

Salmon fishery.—Regulation No. 7 is amended so as to permit commercial fishing for salmon north of 57 degrees north latitude until 6 o'clock postmeridian August 20.

SOUTHERN DISTRICT

Salmon fishery.—Regulations No. 6 and No. 7 are amended so as to permit commercial fishing for salmon until 6 o'clock postmeridian August 20.

[*August 19, 1938*]

SOUTHEASTERN ALASKA AREA

WESTERN DISTRICT

Salmon fishery.—Regulations No. 8 and No. 9 are amended so as to permit commercial fishing for salmon south of 58 degrees north latitude from 6 o'clock postmeridian August 19 to 6 o'clock postmeridian August 20.

[*August 23, 1938*]

SOUTHEASTERN ALASKA AREA

CLARENCE STRAIT DISTRICT

Salmon fishery.—Regulations No. 8 and No. 9 are amended so as to permit commercial fishing for salmon south of a line extending from Approach Point to Caamano Point from 6 o'clock postmeridian August 23 to 6 o'clock postmeridian August 25.

[*August 25, 1938*]

SOUTHEASTERN ALASKA AREA

CLARENCE STRAIT DISTRICT

Salmon fishery.—Regulation No. 7 is amended so as to permit commercial fishing for salmon between a line extending from Narrow Point to Ernest Point and a line extending from Approach Point to Caamano Point, from 6 o'clock postmeridian August 25 to 6 o'clock postmeridian August 27.

[*August 27, 1938*]

SOUTHEASTERN ALASKA AREA

CLARENCE STRAIT DISTRICT

Salmon fishery.—Regulation No. 7, as amended by supplementary regulation No. 251–24–9, is hereby further amended so as to permit commercial fishing for salmon between a line extending from Narrow Point to Ernest Point and a line extending from Approach Point to Caamano Point, from 6 o'clock antemeridian August 29 to 6 o'clock postmeridian August 30.

[*August 29, 1938*]

SOUTHEASTERN ALASKA AREA

CLARENCE STRAIT DISTRICT

Salmon fishery.—Regulation No. 6 is hereby amended so as to permit commercial fishing for salmon north of a line extending from Narrow Point to Ernest Point from 6 o'clock postmeridian August 29 to 6 o'clock postmeridian August 31.

[*August 30, 1938*]

SOUTHEASTERN ALASKA AREA

SOUTH PRINCE OF WALES ISLAND DISTRICT

Salmon fishery.—1. Regulations No. 6 and No. 7 are hereby amended so as to permit commercial fishing for salmon from 6 o'clock antemeridian August 31 to 6 o'clock postmeridian September 2.

2. Alaska general regulation No. 1 is hereby amended so as to permit the holding of salmon in traps in the South Prince of Wales Island district 72 hours after the termination of the fishing season.

[*September 8, 1938*]

SOUTHEASTERN ALASKA AREA

SUMNER STRAIT DISTRICT

Salmon fishery.—Regulation No. 6 is amended so as to permit commercial fishing for salmon by means of gill nets and beach seines in Wrangell Narrows, exclusive of all waters within one statute mile of the mouth of Petersburg Creek, from 6 o'clock antemeridian September 12 to 6 o'clock postmeridian September 30.

[*September 26, 1938*]

KODIAK AREA

Salmon fishery.—Regulation No. 11 is amended so as to permit commercial fishing for salmon between Old Harbor and Kodiak in the period from 6 o'clock antemeridian October 1 to 6 o'clock postmeridian October 15.

ANNETTE ISLAND FISHERY RESERVE

The lease of the fishing and canning privileges of the Annette Island Fishery Reserve by the Annette Island Canning Co. under contract dated April 4, 1933, expired on April 3, 1938. The cannery was again offered to competitive bidders, new proposals being opened on December 15, 1937.

On February 10, 1938, the Assistant Secretary of the Interior, on behalf of the inhabitants of the reserve, entered into a new contract,

effective April 4, 1938, with the Annette Island Canning Co. for the lease of the cannery for 5 years. Under the terms of this contract the Indians are to receive 76 percent of the net profits from the operation of said cannery, and the company 24 percent. The contract provides for a minimum guarantee of $25,000 to the Indians, regardless of whether or not their share of the profits amounts to that figure, except that this provision shall not be effective if the cannery cannot operate because of strikes, lockouts, or stoppage of labor, or from any other cause legitimately beyond the control of the company, or by reason of action by the Government. There is, however, an unconditional guarantee of $10,000 to be paid to the lessors, regardless of the net profits during any year in which the $25,000 guarantee is ineffective due to the above-mentioned causes.

The contract also provides that not to exceed 20 percent of the net profits may be expended by the lessee each year for additions, betterment, and improvement of the cannery, subject to the approval of the Council of the Annette Island Reserve, such expenditures to be repaid to the lessee from the portion of profits accruing to the Indians from the cannery operations.

In 1938 the company operated eight traps within the reservation the catch of which totaled 1,607,595 salmon, and 35,130 salmon taken in purse seines and gill nets were purchased from the natives. In addition, 1,252,705 salmon were purchased from independent operators of traps and seines outside the reserve. Of the total number of fish obtained, 137,370 were sold to other canneries, and the remainder were packed at the company's plant. In the operation of the cannery and of the fish traps employment was given to 69 whites and 368 natives.

Profits to the Metlakatlan Indians of the reserve on the cannery operations for 1937, under the provisions of the lease then in effect, amounted to $79,024.41. Preliminary estimates for the year 1938 under the new lease place the figure at about $63,500.

OYSTER CULTIVATION

Under the authority conferred by the act of August 2, 1937, amending the Fisheries Act of June 6, 1924, with the object of lending appropriate encouragement to the development of oyster culture in Alaska, a 15-year lease, effective July 1, 1938, covering about 100 acres of tide flats in Shoal Cove, Carroll Inlet, southeast Alaska, was executed by the Assistant Secretary of Commerce in favor of William W. Whitcher, of Ketchikan, for the bona fide cultivation of oysters for commercial purposes. This was the first lease of bottoms in Territorial waters under the provisions of the above-mentioned act. A nominal charge is made for such leases, the consideration being at the rate of 10 cents per acre annually.

Application for another lease of oyster bottoms in Alaska was received in December, and a lease was subsequently executed, effective January 1, 1939, covering 75 acres of tidelands in certain waters of George Inlet, Carroll Inlet, Blank Inlet, and Pond Bay, in southeast Alaska, in favor of Celia Fairbanks and Jud Conkle, of Ketchikan.

Beginning in 1931, considerable experimental work has been done in Alaska to determine whether seed oysters may be grown, and the results obtained give fair promise that an industry to supply the local market may be developed.

STREAM IMPROVEMENT

The improvement of salmon spawning streams in Alaska in 1938 was limited, for the most part, to that carried on by stream watchmen in connection with their regular patrol duties, although in the Cook Inlet area some stream-clearing work was accomplished under an allotment of Territorial funds available for this purpose as well as for bounty on predatory trout. The work consisted chiefly in clearing out log jams and other obstructions that hindered the passage of salmon to the spawning grounds. In the removal of obstructions, care is exercised to avoid accelerating the current so as to cause destruction of gravel bottoms used as spawning areas.

In the Kaflia Bay stream, where salmon were having difficulty in ascending long stretches of swift shallow water, construction of additional pools at intervals was undertaken by the Bureau to break the force of the current and facilitate the progress of the salmon upstream.

Increasing numbers of beaver, especially in parts of the Kodiak and Cook Inlet areas, present an important conservation problem. Where necessary, beaver dams have been opened to allow the salmon to ascend to the spawning beds. It is evident, however, that such measures are but temporary, and it is thought that a satisfactory solution to the problem can be found only after due investigation of the potential value of the two natural resources.

CONTROL OF PREDATORY TROUT

The destruction of trout that feed upon salmon eggs and fry has been carried on for a number of years in the Bristol Bay region through funds derived from the Territory and the Bristol Bay packers, the expense being shared equally. Not only has this work resulted in a marked improvement in the runs of red salmon in the region, but it is of material benefit in providing a means of livelihood to residents by furnishing them profitable employment during the winter months. During the year 1938 approximately $17,000 was expended in the Bristol Bay region for bounty on Dolly Varden trout at the rate of 2½ cents per fish.

In the Cook Inlet area, also, stream improvement and predator-control work have been accomplished through an allotment from the Territorial appropriation and contributions of salmon packers. For the years 1937 and 1938 the sum of $5,000 was available for this work. In the destruction of predatory trout, efforts were confined to the Kasilof River and English Bay and Kalgin Island streams in order to determine what the possibilities might be. A bounty of 2½ cents each was paid, as in the Bristol Bay region. Less than 10,000 trout tails taken in the Cook Inlet district were vouchered in the summer of 1937, and the number in 1938 to August 26 was 36,388.

Trout traps for the catching of Dolly Varden trout were operated in connection with the four salmon-counting weirs on Kodiak Island. The number of trout taken in these traps was as follows: 51,385 in Karluk River, 54,317 in Red River, and 17,000 in Olga Bay streams.

Scientific studies of Dolly Varden trout in the Kodiak area were continued.

OIL DRILLING IN BRISTOL BAY AREA

Observations were made by Bureau employees of experimental oil-drilling operations in 1938 at the headwaters of Salmon Creek, tribu-

tary to Becharof Lake of the Egegik River system, and the measures that were taken to prevent stream pollution which might impair valuable salmon runs.

These drilling operations were carried on by an association of the Standard, Union, and Associated Oil Companies. During the progress of drilling in July, a pocket of salt water was encountered at a depth of 500 feet. The pressure in the well shaft was 150 pounds per square inch at the surface, necessitating capping of the well, building of sump pools to prevent leakage into Salmon Creek, and cementing-in of the well casing to a point below the water stratum to cut off further flow. The salt water that was collected in the pools was later gradually released under direction of the Bureau at the period of high water run-off in the stream. The dilution by fresh water was sufficient to prevent any harm to salmon eggs or fry. In order to assure full protection to the salmon populations in the event that further similar deposits should be encountered, the drilling association voluntarily installed more than a mile of 6-inch pipe to carry any wastes from the well to a point on the Pacific side of the peninsula where they may be disposed of without danger to salmon runs.

STREAM MARKING

New markers defining areas closed to commercial fishing were erected to replace those which had become illegible or damaged, and changes were made in the positions of others to conform with changes made in the regulations with respect to closed areas.

STREAM GUARDS

The Bureau employed 134 men in 1938 as stream guards, weir operators, and special workmen in connection with law-enforcement duties. Of these, 57 were stationed in southeast Alaska, 45 in central, and 32 in western Alaska. Some of the workers were engaged for only a few days, but the average period of employment ranged from 2 to 5 months.

In southeast Alaska 21 stream watchmen furnished their own launches and were assigned to patrol larger bodies of water, or in the vicinity of several streams.

In central Alaska 10 guards were stationed in the Seward-Katalla district, 8 on Cook Inlet, 16 in the Kodiak-Afognak district, 3 at Chignik, and 8 in the Ikatan-Shumagin district. Eight of these guards, most of whom were in the Seward-Katalla district, furnished their own launches.

In western Alaska 29 were on Bristol Bay and 3 in the Yukon-Kuskokwim district.

There were also 11 special employees engaged in scientific work—3 on herring and 8 on salmon investigations. This work was carried on in southeast and central Alaska, as heretofore, and in addition an extensive study of the salmon was begun in the Bristol Bay region.

In addition, there were 12 statutory employees, 50 men on the Bureau's vessels, and 2 on the chartered boat.

The foregoing makes a grand total of 209 persons identified with fishery protective work in Alaska in 1938, as compared with 236 in 1937.

VESSEL PATROL

Fourteen vessels of the Bureau were engaged in the patrol for the protection of the Alaska fisheries in 1938. Of these, the *Auklet*, *Kittiwake*, *Merganser*, *Murre*, and *Widgeon* were used in southeast Alaska; the *Eider* was in the Kodiak area, the *Ibis* at Chignik, the *Red Wing* in the Alaska Peninsula area, and the *Coot* on the Yukon River.

The *Blue Wing* was based in the Icy Strait district for a short time in June, then engaged in the patrol and stream survey work on Prince William Sound until August 28, when it was again assigned to southeast Alaska for a brief period before returning to Seattle. As in the previous year, the *Crane* carried part of the Bristol Bay crew and supplies north from Seattle in May and then patrolled the Alaska Peninsula area until the end of July, after which it returned the Bristol Bay crew to Seattle. The *Teal* operated on Cook Inlet from May to August, carried on stream survey work in the Prince William Sound area during most of the month of September, and was used in stream survey and general patrol of the Ketchikan district of southeast Alaska during the fall season until October 19.

The *Scoter* conducted the general patrol of the Bristol Bay area from May 22 to August 3 and then relieved the *Crane* in the Alaska Peninsula area until August 14, after which it returned to Seattle. In the spring, from March 17 to April 12, the *Scoter* assisted in the fur-seal patrol off Cape Flattery, Wash., during the northward migration of the fur-seal herd.

The *Brant* was used in general supervisory work, chiefly in southeast Alaska. In July it made a trip westward as far as Anchorage. On the return trip to southeast Alaska the *Brant* on the morning of July 15 ran aground on Williams Reef, about 8 miles east of Kodiak, causing considerable damage. The Navy vessel *Teal* rendered assistance, towing the *Brant* to Kodiak and later to Hoonah, in southeast Alaska. The *Brant* was towed by the Coast Guard patrol boat *Alert* from Hoonah to Ketchikan, and by the Bureau's patrol vessel *Crane* from Ketchikan to Seattle, where it was laid up for a number of months. In December, the *Brant* made a round trip between Seattle and southeast Alaska in connection with hearings on the Alaska fishery regulations at Ketchikan, Petersburg, and Wrangell.

A minor accident reported during the season was the striking of an uncharted rock in Moira Sound by the *Kittiwake* on July 30. The vessel was able to proceed under its own power to Ketchikan, where repairs were made. The work of the *Eider* in the Kodiak district was cut short on August 19 by a broken crankshaft in the main engine, and the vessel was out of commission for the rest of the season. It was towed by the Bureau's vessel *Teal* to Hoonah, and thence by other Bureau craft to Seattle.

Five speed boats were in operation: No. 1 on Bristol Bay, No. 4 in Prince William Sound, and Nos. 3, 5, and 6 in the Wrangell, Ketchikan, and Juneau districts, respectively. Speedboat No. 6, equipped with a 225-horsepower engine, was in operation this year for the first time. A new 150-horsepower engine, installed in August, greatly improved the service of speedboat No. 4, which had previously been equipped with the 80-horsepower engine salvaged from speed-

boat No. 2 at the time it was destroyed by an explosion in 1935. Fourteen other small power boats were in use also, of which 5 were on Bristol Bay, 1 at Chignik, 2 in the Kodiak area, 2 on Cook Inlet, 2 in the Seward-Katalla district, 1 at Yakutat, and 1 on the west coast of Prince of Wales Island.

In addition to the foregoing, the *Wingham* was again chartered for patrolling the Copper River flats and, at the close of activities there, for operation on Prince William Sound, and the chartered launch *Marie S* was used on the Kuskokwim River.

AERIAL PATROL

Supplementing the regular operations by Bureau vessels and small boats, some use was made of aircraft in the general patrol of traps and fishing grounds. The latter is considered a very effective means of enforcing the fishery laws and regulations, particularly from the standpoint of deterring illegal fishing. Rough water may at times prevent the landing of a plane for making proper investigation when violations are noted, but the possibility of apprehension, when it is known that airplanes are being used for patrol purposes, makes the fishermen more careful to observe the regulations for the protection and conservation of the fisheries.

Chartered airplane service for the patrol of the fisheries in 1938 was furnished by six companies on 23 days. The total flying time was 56 hours, during which the planes traversed 6,246 miles. This patrol included three trips made from Anchorage, covering sections most extensively fished on the east and west coasts of the Cook Inlet area. Twelve and one-half hours flying time were used in the Copper River and Prince William Sound areas, and from 6 to 10 hours each in the Ketchikan, Juneau, Wrangell, and west coast of Prince of Wales Island districts of southeast Alaska.

In addition, chartered airplane service was used for survey and photographic work in connection with scientific investigations of the salmon which were conducted in the Bristol Bay region in western Alaska from July 23 to October 13, 1938. Transportation was furnished on approximately 25 days during this period, and the total flying time amounted to 102 hours, in which the distance covered was about 9,200 miles.

COMPLAINTS AND PROSECUTIONS

In southeast Alaska a floating trap of Libby, McNeill & Libby near Pulizzi Island was found fishing on July 3 during a weekly closed period. The head watchman claimed he thought the day was Saturday, instead of Sunday. The company, through its attorney, pleaded guilty before the U. S. Commissioner at Juneau and was fined $600. The following week a floating trap of the Pacific American Fisheries, Inc., at Pt. Alava was found fishing on Sunday. Complaint against the company and the 2 watchmen, Jack Toner and Roger Davies, was filed before the Commissioner at Ketchikan, who fined the company $500 and sentenced each man to 3 months in jail.

Fourteen purse seine boats were apprehended for illegal fishing in southeast Alaska, and the operators were tried before local U. S. Commissioners, 2 cases being brought before the court at Hoonah, 7 at Ketchikan, and 5 at Craig. In the case against Reuben Eskeberg,

operator of the *Cascade*, apprehended for fishing within 500 yards of the mouth of a salmon stream in Excursion Inlet, a fine of $60 was assessed; while in the case of the *Louise*, found fishing at the mouth of a salmon stream in Tenakee Inlet, the 5 operators, namely, John Kane, Captain; George Paul, William Thomas, Andrew Ibona, and Nicholas Johnson, were fined $25 each, and fish aboard the vessel were seized and sold for $23.08.

Of the defendants tried at Ketchikan, Alex Bryant, captain of the *Mary Lou*, was fined $100, and crew members James Scott, John Davis, Jr., William West, and Henry Littlefield were fined $50 each, for fishing in closed waters at the mouth of Smeaton Creek. Henry Benson, operator of the *Joycelyn*, was fined $25 for fishing within 500 yards of the mouth of a salmon stream in Harry Bay after the beginning of a seasonal closed period. A similar fine was imposed upon Ben Ridley, operator of the *Empress*, for like violations in the same locality, and the salmon aboard the vessel at the time of the apprehension were confiscated and sold for $94.14.

Fines of $25 each were assessed against Ronald Leask and M. M. Dunlap, operators of the *Sea Lad* and *Helen H*, respectively, for fishing within 500 yards of a salmon stream in Thorne Arm during a seasonal closed period, and salmon taken from them were sold for $26.76 and $79.95. Lars Larson, operator of the *Deloma*, was fined $25 for fishing during a closed period within 500 yards of the mouth of a salmon stream in George Inlet, and his illegal catch of salmon was surrendered and sold for $112.78 for the account of the Government. A fine of $25 was assessed against Everett Hudson, operator of the purse-seine boat *Mary Eleanor*, for fishing in closed waters at the mouth of a salmon stream in Weasel Cove, Boca de Quadra, during a seasonal closed period, and his forfeited catch was sold for $39.11.

Of the purse-seine fishermen arraigned before the Commissioner at Craig, fines of $25 each were assessed against Robert Crawford, captain, Lincoln Crawford, and George Mills, of the *Spray*, for fishing about one-half mile inside the markers at Shipley Bay, and against Alfred W. Willard, captain, Orvalle C. Jones, and Melvin M. Jole, of the *31A655*, apprehended at Shipley Bay for carrying shorter seines than the minimum length specified by the regulations. These short seines were ordered sewn together to make one legal seine, and after this was done the seine was inspected by the Bureau's warden.

Three operators of the *Lois W*—Harry Whitten, captain, Clarence Keily, and Eddie Kahaipo—were fined $50 each for fishing within 500 yards of the mouth of the Essowah Lake outlet, a red salmon stream on the west coast of Dall Island, and five operators of the *Silver Wave*, namely, Sid Carle, captain, William Carle, Hugh Baden, Dewey Dudley, and Paul Ozawa, were fined $75 each for fishing on Sunday at the mouth of a salmon stream in Klakas Inlet. The confiscated fish from these two boats were sold for $13.30 and $165.95, respectively. The seine boat *31A985* with a crew of three men—Hermi Valdez, captain, Roy Dado, and Marciana Canote—was found fishing after the beginning of a seasonal closed period in a restricted area in Klawak Harbor, although no fish had been caught. The fine in this case was $20 each, or a total of $60, which was paid by the Ocean Packing Co.

Lewis Duval, of Petersburg, was apprehended for fishing in closed waters in Kah Sheets Bay and during a closed period with a beach

seine 30 fathoms long, an illegal type of fishing apparatus in this locality. The above case was dismissed after the defendant was found guilty on another charge and sentenced to 6 months in jail. Another fisherman, Ed Haynes, illegally using a 45-fathom beach seine in closed waters of Lake Bay, was sentenced by the Commissioner at Wrangell to 60 days in jail and fined $50. At the same time an additional sentence of 30 days in jail, together with a fine of $50, was imposed against this defendant for fishing without a license, in violation of the Territorial law.

Norman Tate and Hugh Harris, operators of the boat *Ann*, were apprehended for fishing at the head of Shipley Bay with small-mesh net, which they claimed was a gill net, although it was really a beach seine, not permissible in this locality. In Commissioner's court at Craig the men pleaded not guilty and subsequently, upon recommendation of the Assistant District Attorney, the case was dismissed in view of the fact that the regulations did not specify the size of mesh to be used in gill nets. The operators were warned against further use of illegal apparatus.

O. R. Batterson, operator of the trolling boat *Arline B*, apprehended for fishing during a weekly closed period near Cape Chacon, pleaded guilty in Commissioner's court at Ketchikan and was fined $50, which fine was suspended. Pascual Roma Niere, who engaged in trolling for salmon commercially during a weekly closed period, pleaded guilty before the Commissioner at Wrangell and was fined $50 and sentenced to 30 days in jail. Four king salmon taken by him were seized and sold for $3.63. This defendant also was found guilty of violation of the Territorial law on two counts, namely, being an alien and fishing without a license, for which he was fined $50 and sentenced to 30 days on each count, the jail sentences to run concurrently with that imposed for violation of the Federal law.

Two cases were brought before the local Commissioner against residents of Yakutat for fishing with set gill nets less than 100 yards apart. One of these violations involved nine persons, as follows: Henry Shodda, Moses Milton, Ned Williams, David Henry, Paul Henry, Jack Reed, Eugene George, Richard Reese, and Tom John In the other, the following four persons were concerned: David Abraham, Mary Henninger, Sam Bagge, and George Valle. All were found guilty, and fines of $30 each, with costs, were assessed. In the case of Henry Shodda, however, the fine and costs were suspended pending good behavior, as he was new in the area.

George Anderson and Oscar Peterson were apprehended in the vicinity of Monte Carlo Island, Keku Strait, for possessing illegal fishing gear consisting of a 25-fathom beach seine. Each was given a 90-day suspended sentence, and the seine was destroyed.

Several pieces of fishing apparatus were found that were evidently being used in violation of the fishery laws and regulations, but the owners were not apprehended. This apparatus included a 20-fathom seine found cached on the bank of a stream tributary to Calder Bay; a trap constructed across the Essowah Lake stream and a 25-fathom seine nearby; a piece of old gear stretched across Andrews Creek near Wrangell; a small gill net, a 10-fathom line, and about 10 fathoms of chicken wire in Klakas Lake stream; and a 75-fathom gill net in Sumner Strait. Except for the last-mentioned gill net, which was turned over to the marshal, this apparatus was destroyed.

The case against the Lindenberger Packing Co., of Craig, for canning fish more than 48 hours after their capture in the 1937 season, which was continued until the spring term of court in 1938, was dismissed. In the case pending at the close of 1937 against Frank Richardson, charged with fishing with a small seine at the mouth of Blind River, Wrangell Narrows, a trial by jury, at the defendant's request, was held on August 8, 1938. The defendant was acquitted on the plea that the markers were not at the mouth of the stream but that the tide backs up 1½ miles above them.

In the Seward-Katalla district, 11 cases of illegal fishing, involving 14 persons, were brought before Commissioner's court, and convictions were obtained and fines imposed in all instances except one. Of these cases, one involved the taking of undersized clams for commercial purposes by A. W. Marcus, who was fined $25. His forfeited catch, amounting to 452 pounds, was sold for $24.86. There were four cases of illegal seine fishing for salmon, as follows: Jack Brady, fishing with a skiff and seine during a weekly closed period, fined $100; Oscar Donaldson, fishing aboard the *Katherine L* during a weekly closed period in a restricted area at the head of Eaglek Bay, fined $75; Arthur G. Clark and William Imlach, fishing with seine boat *31B839* in the mouth of a salmon stream in Hawkins Cutoff, fined $50; and William Stears and Clarence Betchel, fishing with the *Cambria* inside markers at the mouth of lagoon in Eaglek Bay, fined $50.

Six violations in the Seward-Katalla district involved the illegal use of stake or set gill nets in sloughs of the Copper River area which were closed to commercial fishing. In one case, that against William P. Smith, operator of the boat *31D463*, observed in Pete Dahl Slough by the Bureau's warden while on airplane patrol on June 11, the defendant denied any knowledge of the set net, and the case was dismissed for lack of sufficient evidence. In the other cases pleas of guilty were entered in Commissioner's court and a fine of $75 was assessed against each defendant, as follows: Harold Couzins, operating stake net in Walholla Slough on May 24; Charles Christensen, set netting in Pete Dahl Slough with the boat *31B540* on June 11; Otto Tiedeman and Emil Freeman, using set nets in Pete Dahl Slough on June 11; and Wilbur Platt, with the boat *31A956*, and Gilbert Young, with the boat *31B353*, using set nets inside Mountain Slough on July 8. One hundred and twenty-one red salmon in the possession of Harold Couzins at the time of his apprehension were sold for $33.28. A catch of 451 red salmon was surrendered also by Messrs. Tiedeman and Freeman and sold for the account of the Government for $124.03.

In the Cook Inlet area six cases of violations of the regulations were reported, most of which were observed by means of airplane patrol. A trap owned by the Cook Inlet Packing Co. and located about 15 miles north of Ninilchik Village was found with the tunnel not closed and the heart walls not lifted or lowered during a weekly closed period in accordance with the method prescribed by section 5 of the Act of June 6, 1924. Complaint was filed before the Commissioner at Seldovia against both the company and the trap watchman, Simeon Oskolkoff. The latter admitted the charge but claimed his timepiece was wrong. He was fined $100. The company, through its managing owner, pleaded guilty and was fined $200.

Otto Rensing, operator of power boat *31C40*, found fishing with a beach seine inside markers at the mouth of Chinik Creek on July 13,

was taken before the Commissioner's court at Seldovia, where he pleaded not guilty. As he had been apprehended with others earlier in the season fishing in McNeil Creek and had been dismissed with a warning, he was bound over to the District Court under $500 bond. When the case came before the Grand Jury in November, it returned a nontrue bill.

Fines of $50 each were assessed by the Commissioner at Anchorage against Buster Ephin and George Johnson, apprehended for operating set gill nets during a weekly closed period in Cook Inlet, the former having three set nets about 5 miles southwest of Point Possession on June 13, and the latter using a set gill net on June 6 and two of such nets on June 13 in Lewis River Slough.

Prosecutions were brought before the Commissioner at Seldovia against Michel McDonough and Frank Manton for operating three set gill nets about three-fourths mile south of Cape Kasilof during a weekly closed period. The latter claimed sole responsibility for the violation and pleaded guilty as charged. The court assessed a penalty of 30 days in jail and suspended the sentence. An anchored gill net, found fishing between Beluga River and Three Mile Creek during a weekly closed period, was seized and 10 king salmon therein were sold for the account of the Government. Later it was learned that the net belonged to Mrs. T. B. Ryan and that she was fishing for her dogs. After due investigation and conference with the United States Attorney, the net and the money received from the sale of the salmon were returned to the owner.

In the Kodiak area, two gill-net fishermen, Frank Marshall and Mike Naumoff, were arraigned before the Commissioner at Kodiak for fishing in Olga Bay during a weekly closed period. They pleaded guilty and were fined $25 each. Operators of three purse seine boats in this area also were brought before the Commissioner's court at Kodiak, where they pleaded guilty and were fined, as follows: Pat Gowan and L. Rachford, fined $25 each for setting seine from the *Jaquelin* alongside another purse seine in the Karluk district, after having been warned to observe the 100-yard distance interval; and Edwin Liljegren, operator of the *L & W*, and Ben Durkee, operator of the *Triton*, fined $75 and $100, respectively, for fishing along Seven Mile Beach during a seasonal closed period. Seized fish, consisting of 2,411 pinks and 160 chums, from the *L & W* were sold for $123.70, and 3,439 pinks and 803 chums from the *Triton* were sold for $195.03.

In the Alaska Peninsula area, the purse seine boat *Blanche*, commanded by John Bacoka, was apprehended on June 17 for fishing about one-quarter mile from a salmon trap in East Anchor Cove. Upon trial before the Commissioner at Squaw Harbor, the defendant pleaded guilty and was fined $75, with a warning also that any future violations by operators in the district would receive sterner action. Fish aboard the vessel at the time of the seizure were valued at less than $3 and were not confiscated. Andrew Hotovitsky, beach seiner commanding the gas boat *Swinomish*, was apprehended on July 22 for fishing in closed waters at the mouth of a salmon stream in Little Canoe Bay. He pleaded guilty in the Commissioner's court and was fined $200. His forfeited fish, consisting of 1,238 chums and 294 pinks, were sold for $82.37.

Evidence of illegal fishing in Thin Point Lagoon resulted in investigation of Andrew Hotovitsky and Alex Bendixsen. Circumstances

surrounding the cases prevented any conviction. Mr. Bendixsen was released with a warning, and Mr. Hotovitsky was ordered to appear some time later in Commissioner's court at Squaw Harbor, although his fishing gear was not seized and he was allowed to continue fishing. Meantime the case was reviewed by the Commissioner and, owing to insufficient evidence, it was dismissed without a hearing.

No violations of the Federal fishery laws and regulations were reported for Bristol Bay. In this area, however, 115 complaints were filed against alien fishermen under the Territorial law (Chapter 30, Session Laws of Alaska, 1933), on which there were 62 convictions. Fines totaling $10,600 were collected, and suspended fines amounted to $350. Jail sentences were enforced in 58 cases and suspended in 4 cases.

TERRITORIAL LICENSE TAX

Fisheries license taxes were collected by the Territory under the general revenue law of 1921, as amended in subsequent sessions of the Territorial Legislature. A statement from Oscar G. Olson, Territorial Treasurer, under date of June 6, 1939, gives the collections made to that date for the year 1938, representing the taxes on operations of the previous year. It was stated that collections under the several schedules were fairly complete, although a few of the fisheries companies had not yet made full settlement.

It will be noted that the following schedule includes the amounts collected for clam diggers' and fishermen's licenses, which have previously been omitted from the report.

Fishery license taxes collected by Territory for fiscal year ended Dec. 31, 1938

Schedule	Division No. 1	Division No. 2	Division No. 3	Total
Salmon canneries (pack)	$150,765.01	$22.00	$512,426.21	$663,213.22
Clam canneries			355.83	355.83
Salteries	2,483.42	82.28	1,140.64	3,706.34
Cold-storage plants	1,175.00	10.00	50.00	1,235.00
Fish-oil works and fertilizer and fish-meal plants	10,729.40		22,383.73	33,113.13
Fish traps	53,100.00		32,150.00	85,250.00
Trap catches in excess of 100,000 fish	7,499.91		16,182.44	23,682.35
Gill nets	675.00	30.00	3,646.40	4,351.40
Seines	3,885.00		2,260.00	6,145.00
Clam diggers:				
Resident	5.00		265.00	270.00
Nonresident			75.00	75.00
Fishermen:				
Resident	2,812.00		2,485.00	5,297.00
Nonresident	24,575.00		49,625.00	74,200.00
Total	257,704.74	144.28	643,045.25	900,894.27
Salmon canneries (net income), not possible of segregation as to judicial division				7,053.02
Total collections				907,947.29

KUSKOKWIM RIVER

A patrol of the Kuskokwim River was maintained by Theodore R. Lambert, with the chartered launch *Marie S*, from the first of June until the end of August.

King salmon appeared at the mouth of the river on May 20, or somewhat earlier than usual, and the run continued steady through June, after which a few late stragglers were taken until the end of July. Most of the kings taken by natives, particularly near the mouth

of the river, are for daily use, as they require more time and attention for drying than do other species.

Both chum salmon and reds were unusually abundant this year. A heavy run of chums started on June 19 at the mouth of the river and continued strong until the middle of July, when it dropped off sharply. The bulk of the red-salmon run entered the river between July 1 and July 15. Toward the end of July a few cohos were taken in the vicinity of Bethel, and a good run began on August 1, which continued heavy for only a few days while a southwest wind prevailed. Stormy weather throughout August made it impossible to dry cohos except under cover in the smokehouses. All natives who fished with any regularity had previously caught and cured sufficient fish for their winter use, and many disposed of a surplus to traders. The latter by the end of July had obtained all they could handle during the winter.

Fishing apparatus used by the natives between the mouth of the river and the Narrows consists mainly of set nets, from 9 to 30 fathoms in length. Drift nets are not considered practical for general use in this locality because of the extreme width of the river and the many bars and channels. Much of the time it is too rough offshore for the use of small boats. Between the Narrows and Tuluksak the bulk of the catch is taken by drift nets, from 25 to 50 fathoms in length, although set nets are used to some extent. Upstream above Akiak the current is stronger and the fish wheel is the main gear, with comparatively few drift and set nets in use.

The only commercial fishing operation in the district for the outside market was that of Robert Gierke, who reported an output of 6 tierces of pickled cohos and 12 tierces of pickled kings. Three hundred and eighty natives fished in the river for local food requirements, using 520 gill nets of 13,499 fathoms, 47 wheels, and a number of small boats. They prepared 243 tons of dried chums, 22 tons of dried kings, and 21 tons of dried reds.

YUKON RIVER

Three outfits prepared mild-cured salmon on the Yukon River for the outside market, as follows: Northern Commercial Co., which operated on a barge in Acheron Channel; St. Mary's Mission, at the head of Sunshine Bay in Acropok Slough; and Chris Lauridsen, at Kwiguk Slough. Their total output of mild-cured salmon was 198 tierces of kings. The fish used by the Northern Commercial Co. were taken in gill nets outside the mouth of the Yukon River by native fishermen; while those handled by the other two operators were taken in the river by wheels and gill nets, respectively.

Inspector Calvin F. Townsend and a stream guard patrolled the district aboard the *Coot*, leaving Nenana on May 26 for the mouth of the Yukon and returning to Nenana on September 18. During the trip downstream the water was at low stage, with very little driftwood. At that time there was little activity at the camps, as the inhabitants were out hunting beaver and muskrats. In general, the supply of dried fish from the previous season had not lasted through the winter, but plenty of whitefish had been caught by means of traps through the ice.

The first king salmon were caught at the mouth of the Yukon on June 1, but the main run began on June 5 and continued good until

July 15. Chum salmon came into the river at the same time, and the runs of both species were unusually heavy. Beluga whales were more numerous than for many years and did considerable damage to salmon nets. Several of these whales were taken by the natives to supplement their regular supply of food.

As a result of the excellent runs of king and chum salmon and the good weather for drying fish, natives on the lower river had all the fish they needed for winter. The catches at camps in the upper reaches, however, were not uniformly good. In some places the catches were above average and in others very poor. An explanation for the light catches of kings at certain points was that the fish seemed to follow the main channel up the river and did not strike in close to shore, so they were not taken in the wheels and nets.

There was a marked shortage of salmon on the Tanana River, and the only camp which had any success in fishing was one about 8 miles from Tanana, where fair catches of cohos were obtained from the last week of August until the middle of September. Very few of this species were taken along the Yukon because of high water and heavy driftwood. As a result of storms in August the Tanana River was at flood stage from about the 10th to the end of the month.

Products of the Yukon and Tanana fisheries, including those shipped to the outside market, were as follows: 280 cases of king salmon canned; 198 tierces of mild-cured kings; 17,300 pounds of dry-salted kings; and 213 tons of dried chums. Apparatus consisted of 194 wheels, 88 gill nets of 2,100 fathoms, 3 motor vessels of 43 tons, 1 launch, 9 gill-net boats, 1 scow, and miscellaneous small boats. There were 11 whites and 382 natives engaged in the fishery.

WEIRS FOR COUNTING SALMON ESCAPEMENT

The maintenance of weirs through which the escapement of brood fish may be counted provides information of value in the study of the life history of the salmon and in the regulation of commercial operations to prevent any impairment of the runs through inadequate seeding of the spawning beds.

Eleven weirs were operated in representative streams of Alaska in 1938, and a count of salmon was again made at the Kalgin Island stream without the use of a rack. It was the purpose, also, to re-establish the weir in Chignik River, which had been operated each season since it was first placed there in 1922, but unusually high water for a prolonged period made all attempts to construct it unsuccessful.

Reports of the weir operations and the counts of salmon in 1938 were as follows:

Alitak Bay

Two weirs were again established on Olga Bay, tributary to Alitak Bay, construction of the cannery station weir being completed on May 26 and the upper station weir on May 29. At each place the counting of red salmon began on the day the weir was ready and was continued until the structure was removed on August 29. The total count for the season at the upper station weir consisted of 616,064 red salmon, 3,371 pinks, and 9,085 cohos. Corresponding figures for the cannery station weir were 97,455 red salmon, 23,701 pinks, and 371 cohos.

In the latter part of July the catch of red salmon in the Alitak Bay district was substantially larger than the escapement. Olga and Moser Bays, therefore, were closed to commercial fishing at 6 p. m. on July 30 and reopened at 6 a. m. on August 13. During that interval approximately 319,000 red salmon were counted through the weirs, the bulk of the escapement being during the second week and reaching its peak on August 13, when 61,541 fish of this species were tallied.

A trout trap operated at the upper station weir took 10,047 Dolly Varden trout during the season, and one at the cannery station took 6,953 of these predatory fish.

Work at the cannery station weir was carried on by Morris Rafn, and at the upper station weir by Lloyd Burns, under the direction of Warden J. Steele Culbertson.

Chignik River

No weir was maintained in the Chignik River in 1938, as it was impossible to establish the structure because of high water. After repeated attempts to construct it were unsuccessful, the work was finally abandoned toward the end of June.

In general, there was a rather light run at Chignik during the season. The commercial catch was 407,605 red salmon, and it was estimated that 550,000 of that species escaped to the spawning grounds. The early escapement was good, owing to the fact that salmon traps were not installed until the latter part of June. Chignik Lagoon and part of Chignik Bay were closed to commercial fishing from 6 a. m. August 15 to 6 a. m. August 19, in addition to the closed periods specified by the regulations.

Chinik Creek

From July 6 to July 29, inclusive, 3,804 red salmon were counted through the weir at Chinik Creek, and it was estimated that 200 reds were in the stream below the weir at the time the structure was removed. The peak of the run was on July 25, when 1,008 salmon were tallied. Irwin Metcalf was in charge of operations, under the direction of Capt. R. L. Cole.

English Bay

The count of salmon in the stream at the head of English Bay began on June 8 and continued through August 13, during which time the total escapement numbered 16,779 red salmon. The largest count for any one day was 806 on July 26. Weir operations were carried on by Percy G. Maltbie until August 6, and then by Irwin L. Metcalf, under the supervision of Capt. R. L. Cole.

Fish Creek

Counting operations at the weir in Fish Creek were carried on from July 10 to August 8, inclusive, the total number tallied consisting of 182,463 red salmon and 19,417 cohos. The latter species began to ascend on July 24 and were estimated to be 10 percent of the total

count for the first week and 20 percent thereafter, as it was impossible for the operator to make an exact count of each species. The bulk of the red salmon escapement passed upstream in the period from July 22 to August 1, reaching a peak on July 23, when 23,540 fish were counted. Jack Tansy was assigned by Capt. R. L. Cole to perform the work at this weir.

Kalgin Island Creek

As in previous years, the stream guard stationed near the salmon stream on the east side of Kalgin Island made a count of the red salmon escapement, although no weir was established in that stream. From June 15 to August 3, inclusive, there were tallied 5,046 red salmon, about one-third of which passed upstream during the last week in July.

Karluk River

Construction of the weir in Karluk River was begun on April 9 and completed on April 13. Although virtually all ice had gone out of the river, high water made the weir construction rather difficult. Both red and king salmon began to pass upstream on May 19, but the numbers were small until June 8, when a very good run set in. Within the next 3 weeks more than 700,000 red salmon were counted through the weir, the run reaching its peak on June 18, when 83,102 salmon were counted. The large escapement during this period was owing partly to the fact that very little fishing was being carried on, as operations in the district had been delayed on account of the strike of cannery workers.

Pink salmon appeared off the mouth of the river on July 17 and began to pass through the weir two weeks later. A very heavy run of pinks entered the river during August. Owing to the large number of spent fish coming downstream, it was impossible to keep the weir closed after September 3, and the structure was finally removed on September 26.

The total escapement for the season consisted of 1,075,678 red salmon, 1,714,589 pinks, 40,000 cohos, and 5,606 kings. These figures include an estimated escapement of 200,000 reds, 75,000 pinks, and 40,000 cohos during the period from September 4 to September 26, when the weir was left open. Commercial fishing in the Karluk district was closed on September 3 for the remainder of the season, in order to assure a 50-percent escapement. The total commercial catch of red salmon from the Karluk run was 976,904.

In connection with the operation of the Karluk weir, traps were installed for the capture of Dolly Varden trout, and 51,385 of these predatory fish were taken during the season.

Weir operations were in charge of James O'Brien, under the direction of Warden J. Steele Culbertson.

Klawak Creek

Construction of the weir in Klawak Creek was completed on May 24 and counting operations began on the following day, when a few red salmon passed upstream. This run was light but fairly steady throughout the season. On August 10 the first pinks and cohos were

tallied. The run of pink salmon reached its peak on September 16, when 64,119 fish of this species were tallied through the weir. The total escapement numbered 357,751 pinks, 22,209 chums, 15,368 reds, and 4,398 cohos, including an estimate of 15,000 pinks, 4,000 chums, and 1,000 cohos on September 26. Heavy rains the night of September 25 caused the creek to rise about 4 feet, as a result of which the weir was damaged beyond repair for the season. Lloyd M. Johnson was weir foreman, under the direction of Warden Donald S. Haley.

Little Port Walter

At the Little Port Walter weir, operated in connection with the biological study of pink salmon in southeast Alaska, there were counted 6,467 pink salmon, 5 chums, and 1 coho in the period from August 29 to September 22, inclusive. It was estimated that 200 salmon were in the bay when the weir was removed.

Orzenoi River

From June 14 to Aug. 7, inclusive, there were counted at the weir in Orzenoi River 8,675 red salmon, 1,764 pinks, 510 chums, and 40 kings. The peak of the run was on July 17, when 1,427 red salmon passed through the weir. During most of July the stream was low, as there was little rainfall. Gordon Ashton carried on the weir work at this place, under the direction of Acting Warden Mark Logan.

Red River

King salmon began to pass upstream through the Red River weir on May 21, and reds on May 25. The run of red salmon was somewhat smaller than in other recent years, the total count for the season numbering 185,851. Other species tallied were pinks, 406,725; kings, 4,465; and cohos, 2,169.

Counting operations were continued until heavy rains caused the river to rise over the top of the weir on August 25. As the structure was badly damaged, its removal was begun on the following day when the high water subsided. There was a fair showing of salmon in the lagoon and some outside the river in the strait at that time. It was estimated, therefore, that the total escapement of reds would be more than 200,000. The Red River district was closed to commercial fishing for salmon after August 13, as the catch was then considerably in excess of the escapement.

Two trout traps operated in connection with the weir caught 54,317 Dolly Varden trout during the season.

The work at this place was in charge of Woodrow Buckley, under the supervision of Warden J. Steele Culbertson.

Situk River

Construction of the weir in Situk River was completed on June 7, and the first red salmon were counted on June 12. No count was made from June 18 to June 25, inclusive, as the weir was out of commission during a period of high water. As soon as the river fell sufficiently, the weir was dismantled and reestablished about 30 feet above the former site. Counting was resumed at noon on June 26 and con-

tinued through August 2, when the weir was removed because of high water and anticipated floods which threatened a loss of materials. The total count numbered 169,333 red salmon, 28,319 pinks, and 2,668 kings. A. W. Tveter carried on the weir operations under the direction of Warden William B. Berry.

SALMON TAGGING

A salmon-tagging experiment was conducted in southeast Alaska in 1938 to develop further information concerning the migration routes of pink salmon through lower Chatham Strait. Approximately 2,100 mature pink salmon were tagged from July 7 to Aug. 12, inclusive, the work being done at traps in Tebenkof Bay by employees of the Division of Scientific Inquiry. Of the total number tagged, 637 salmon, or slightly more than 30 percent, were recaptured by the commercial fishery. It is planned to conduct a similar experiment in 1939 to determine any differences in the migration routes of the pink-salmon runs in even- and odd-numbered years.

In the 1938 season, also, a tagging experiment was carried on in the Kodiak area to determine the length of time the fish take to travel from Alitak Bay to weirs in Olga Bay. As commercial fishing is controlled by the weir count, it seemed advisable to determine the lag between catch and counted escapement. Seven hundred red salmon were tagged at the Bun Point trap of Pacific American Fisheries on June 28, and 458 were tagged on July 29 at the Miller Island trap. The work was done by Associate Aquatic Biologist Joseph T. Barnaby and Junior Aquatic Biologist Allan C. DeLacy, assisted by the crew of the *Eider* and Stream Watchman Morris Rafn. A red streamer-type tag, designed by Messrs. Barnaby and DeLacy, was used for the first time in this experiment. The tags were attached to the dorsal part of the body just posterior to the dorsal fin and were readily observed as the fish passed through the weir.

Of the fish tagged in the Kodiak area in June, less than 5 percent were observed subsequently at the weirs, while nearly 50 percent of those tagged in July were counted. A closed period from Aug. 1 to 12 in the commercial fishing season aided in obtaining a larger escapement from the latter tagging.

The fish tagged in June took an average of 7 days to go to the cannery station, and 9 days to the upper station. In the second experiment, however, the fish took an average of 17 days to go to the cannery station, and 11 days to the upper station. No explanation can be given as to the relatively short period taken to reach the upper station, compared with that taken to reach the cannery station. This investigation indicates that the fish arrive at the weirs from 1 to 2 weeks after they pass the fishing gear in Olga Bay.

SALMON LIFE-HISTORY STUDIES

Studies of the life histories and fluctuations in abundance of the Pacific salmon in Alaska were continued in 1938 by the staff of the Fisheries Biological Station at Seattle, Wash. The major investigations of the red salmon at Karluk and the pink salmon at Little Port Walter were carried on as formerly. In July 1938 an appropriation was made available for a comprehensive and extended investigation

of the red-salmon fisheries of Bristol Bay. This investigation consisted of two distinct parts, one dealing with the marine factors influencing the migration of the salmon and their availability to the commercial fishery, and the other dealing with the fresh-water life history and survival of the young in the lakes and streams.

Biological data concerning the red salmon were collected at Chignik and Copper River stations, as in past years. Studies carried on at Karluk River and Little Port Walter gave further insight into the natural factors that influence the abundance and survival of the salmon.

The studies concerning the influence of predatory trout at Karluk River and neighboring streams on Kodiak Island were continued. The tagging of these trout shows that they do not have the high degree of homing characteristics of salmon, but they wander back and forth between the streams on Kodiak Island.

Through the efforts of the C. C. C. workers, as directed by the Forest Service, the station at Little Port Walter was greatly improved by the construction of trails to the headwaters of the stream and of a dock with floating mooring for the accommodation of large boats that visit the field station. The Forest Service also used the stock of acclimated rainbow trout in Sashin Lake, one of the lakes at the head of the stream, for transplantation in many lakes on Baranof Island, and also for a stock sent to Fairbanks.

The collection, compilation, and analysis of the records of daily catches of salmon throughout Alaska by the principal types of fishing apparatus were continued in 1938 and, as in previous years, provided information as to the fluctuations in abundance and time of appearance of the runs in various districts. Considerable effort was made also in securing additional historic material and records on the fisheries of Bristol Bay in connection with the newly developed investigation of the red salmon in this area. The information secured from this work, as in previous years, was used in recommendations for changes in the fishery regulations throughout the Territory for properly conserving salmon populations.

OBSERVATIONS ON THE ESCAPEMENT OF SALMON

The so-called "White Act" of June 6, 1924, established the intention and policy of Congress that not less than 50 percent of the salmon runs in Alaskan waters should be permitted to escape. In certain representative streams counting weirs are operated to accurately fulfill this requirement. Where the operation of weirs is not feasible the development of runs is closely observed so that regulations may be modified during the season if necessary, to secure the most desirable spawning escapement. There follows a general summary of salmon runs and escapement in each of the fishing areas of Alaska.

Southeastern Alaska.—The late appearance of pink salmon runs in southeastern Alaska was characteristic of the even-year cycle of this species in recent years. A prolonged dry season in August, and the consequent low level of streams, retarded the ascent of salmon to spawning areas, but heavy rains after the first of September relieved this condition in all districts. The fall survey of spawning grounds was hampered in many cases by the swollen condition of streams.

In the Ketchikan region, embracing the southern district and that part of the Clarence Strait district south of Ernest Point, the run was of average proportions and considerably better than in 1937. As in past years, the run appeared several days earlier in the southern district than in Clarence Strait, and in both sections it was at its peak as the fishing season closed. Stream inspections indicated a rather spotted seeding, but these districts generally appeared to have obtained adequate escapements. In the southern district the better spawning areas were well seeded, particularly streams in Very Inlet, Boca de Quadra, Smeaton Bay, and Rudyerd Bay. In the western portion of Behm Canal a good escapement of reds and a fair seeding of pinks were observed on the spawning grounds at Loring and Yes Bay. In the Clarence Strait section fair escapements were noted in Tolstoi Bay and Thorn Bay, while streams in Kasaan Bay, Cholmondeley Bay, and Moira Sound were well seeded.

In the Wrangell district, including the waters of Sumner Strait and Clarence Strait, north of Ernest Point, the run fell considerably short of last season and was the smallest that this district has seen in recent years. Indications are that additional protective measures are necessary to restore this run to its former abundance. A survey of streams in this area revealed a rather light escapement, but there appeared to be a fair seeding of the better spawning areas. particularly in Anan Creek, Salmon Bay, Bradfield Canal, and Totem Bay. A good run of reds and cohos occurred in the Stikine River area and the escapement there was believed to be ample for seeding purposes.

There was no heavy sustained run at any time during the season in the South Prince of Wales Island district. Pinks appeared in small numbers about August 13, and after August 27 there was a fair showing of this species off Dall Island, Cordova Bay, and Trocadero Bay. The run of sockeyes, while considerably better than in 1937, was below normal, and chum and coho runs also were disappointing. The total count of each species through the Bureau's weir in Klawak Creek was substantially below the average escapement in recent years. Spawning areas in Tuxekan Passage were well seeded, however, compared with the 1937 season, and Sarkar Lakes, Deweyville, El Capitan Passage, Calder Bay, Sea Otter Sound, and Davidson Inlet all had fair escapements.

On August 1 and 2 a good showing of pinks in Cross Sound proved to be only a spurt which tapered off as the run reached the inner section of Icy Strait and spent itself. The main body of pink salmon entered Icy Strait after fishing operations had been terminated in that district, and moved into the inner waters of Chatham Strait and Frederick Sound about the middle of August. The sun was heavy but of short duration and the escapement in the streams of Icy Strait was below normal. In the Western district, streams tributary to Chatham Strait were found to be well seeded with pinks, except in the Hawk Inlet area, where the escapement was poor. The streams inspected in the Eastern district indicated a good escapement for that section also, although the survey there was hampered by heavy rains and high streams. All three sections of the Juneau district experienced average runs of reds and cohos, and the escapement of these species was generally satisfactory. Chums were less abundant than in other years, however, and the seeding of this species was below normal.

The Yakutat area had a better than average run of reds and kings this season, especially in Dry Bay and Situk and Ahrnklin Rivers. Good escapements were reported for all important species in this area.

Prince William Sound and Copper River region.—The run of pinks was unusually late in Prince William Sound but developed rapidly after July 24, reaching large proportions in all sections during the last few days of the season. Pinks were so abundant throughout the area as the close of the commercial fishing season approached, that the Secretary of Commerce approved a supplementary regulation extending the season 2 additional fishing days. A survey of representative salmon streams indicated an excellent seeding of pinks in most spawning areas. Unusually heavy escapements were observed in the northern and eastern sections of the Sound.

A good run of red salmon occurred in the Copper River area, reaching its peak shortly after the first of June. The escapement to the upper river was very satisfactory, owing partly to the stormy weather that hampered fishing operations and reduced the commercial take.

Cook Inlet.—Although the early run of reds in Cook Inlet was light, the main run appeared in good volume after July 19 and continued strong until August 8. This run was good throughout the Inlet, and was especially heavy between the Kenai and Kasilof Rivers, and in the vicinity of Salamato Beach, between East Foreland and Kenai River. The run of kings was lighter than usual, amounting to only about two-thirds of its normal size. A good escapement of reds was observed on the major spawning grounds, especially in Kasilof and Kenai Rivers, but in Chinik Creek, Cottonwood Creek, and the Kalgin Island stream the escapement was almost a failure. The pink-salmon run was considered fair in most sections, and the seeding of this species as a whole was good, especially in streams south of Anchor Point.

Kodiak area.—The run of reds in the Kodiak area varied considerably in the important red producing sections. The Alitak Bay region had an unusually large run and escapement; in Red River the showing of reds was very poor; and in the Karluk region a normal run occurred and the escapement was good. Kodiak Island as a whole had a light run of pinks, as is generally the case in the even years, although the pink run at Karluk was the largest in many years, and Red River, Alitak Bay, and Uganik Bay had good runs of this species. It is believed that the escapement of pinks was adequate for seeding purposes. The run and escapement of chums was very good generally, but the showing of kings and cohos was only fair.

Chignik.—The runs of all species in the Chignik area were very light this season, but the fact that commercial operators were late in installing traps contributed to the escapement of early runs. Only one trap was operated during the month of June and the red run reached its peak during the last week of that month. The run of pinks was the weakest since 1931, and the showing of cohos and chums was also poor. Unusually high water in the Chignik River prevented the installation of the weir this season. Stream observations, however, indicated a good escapement of red salmon, although the seeding of other species was poor.

Alaska Peninsula.—The red run in Peninsula waters this season was unusually heavy, although, for unknown reasons, fishing gear on

the south side of the Peninsula intercepted a smaller portion of the run than in past years. Pinks and chums were late in arriving but were abundant after July 22, with the exception of a slack period from August 7–10. The run was characterized by the unusually small size of pinks, which in some instances were packed 40 or 50 to a standard case of 48 1 pound-cans. Although not as comprehensive as desired, the survey of spawning areas indicated a rather spotted escapement. It is believed that the Peninsula streams generally were not as well seeded as in other recent years.

Bristol Bay.—The best red-salmon run in the history of the area occurred in Bristol Bay this season, reaching its heaviest volume in the Kvichak-Naknek district and in the Nushagak district. In most sections the run started on July 5, and held up well until the 23d, reaching its peak about the middle of the month. Reds appeared in the Ugashik district at least a week later than in other sections, but the run in this section, as well as in the Egegik district, was weak.

Extensive observations were made, by airplane and boat, of the spawning areas accessible to Bristol Bay red salmon. Of the four important watersheds, the Kvichak-Naknek and Nushagak systems received excellent escapements, the Egegik region was rather poorly seeded, and the Ugashik streams were only thinly populated as usual. Taken as a whole, however, the spawning beds of the Bristol Bay area were well seeded.

GENERAL STATISTICS OF THE FISHERIES

The total number of persons engaged in the fisheries of Alaska in 1938 was 28,084, or 2,247 less than in 1937. Fishery products were valued at $42,869,726, a decrease of $8,873,494, or 17 percent, from the value in the preceding year. Of the total amount, 91 percent represented the value of salmon products; 5 percent, herring; 2 percent, halibut; and 2 percent, the value of all other fishery products.

Summary of persons engaged and products of the Alaska fisheries in 1938

Item	Southeast Alaska		Central Alaska		Western Alaska		Total	
	Number	Value	Number	Value	Number	Value	Number	Value
PERSONS ENGAGED								
Whites	7,312		5,305		4,167		16,784	
Natives	3,312		1,712		1,234		6,258	
Chinese	71		107		194		372	
Japanese	453		153		96		702	
Filipinos	1,241		999		1,086		3,326	
Mexicans	14		50		329		393	
Puerto Ricans			10		77		87	
Kanakas	1		14		21		36	
Negroes	8		27		49		84	
Miscellaneous	3		12		27		42	
Total	12,415		8,389		7,280		28,084	
PRODUCTS								
Salmon:								
Canned cases	2,713,948	$11,711,803	2,179,765	$10,514,492	1,913,285	$14,410,602	6,806,998	$36,636,897
Mild cured pounds	6,344,000	1,257,247	16,800	1,600	158,400	20,084	6,519,200	1,278,931
Pickled do	9,600	900	313,200	31,228	854,885	90,293	1,177,685	122,421
Fresh, for food do	3,817,042	291,335					3,817,042	291,335
Frozen, for food do	7,183,446	530,891	1,600	60			7,185,046	530,951
Frozen, for bait do	720,652	7,241					720,652	7,241
Frozen, for fur farms do	61,420	2,500					61,420	2,500
Dry-salted do	10,500	1,132	18,000	500	17,300	1,730	45,800	3,362
Dried do			4,025	140	998,000	71,200	1,002,025	71,340
Eggs for fish food do	7,300	365					7,300	365
Fertilizer do	1,832,000	27,480	242,000	3,933			2,074,000	31,413
Oil gallons	53,588	10,717	14,400	5,040			67,988	15,757
Herring:								
Fresh, for bait pounds	2,826,404	37,865	1,250	13			2,827,654	37,878
Frozen, for bait do	3,316,114	23,924					3,316,114	23,924
Pickled, for food:								
Scotch cure do			1,634,000	97,927	552,150	32,497	2,186,150	130,424
Norwegian cure do					192,800	5,784	192,800	5,784
Roused for food (bloater stock) do			261,350	6,395	155,550	6,360	416,900	12,755
Meal do	7,279,394	132,032	24,911,116	417,582			32,190,510	549,614
Oil gallons	900,921	267,021	3,622,192	1,025,684			4,523,113	1,292,705
Halibut:								
Fresh pounds	6,794,439	429,448					6,794,439	429,448
Frozen do	6,761,916	460,853					6,761,916	460,853
Livers do	133,000	66,500					133,000	66,500
Viscera do	240,787	24,079					240,787	24,079

Cod:									
Dry-salted	do			135,119	6,797	146,019	8,421	281,138	15,218
Stockfish	do			6,126	796	552	82	6,678	878
Tongues	do			600	75	125	10	725	85
Whale:									
Oil	gallons					304,800	103,657	304,800	103,657
Sperm oil	do					181,900	54,570	181,900	54,570
Meal	pounds					1,224,000	21,414	1,224,000	21,414
Clam:									
Canned	cases	9,865	59,190	30,945	193,309	35	175	40,845	252,674
Juice	do	25	100					25	100
Crab:									
Meat:									
Canned	do	5,373	48,267	12,371	121,213			17,744	169,480
Cold packed	pounds	2,765	1,134					2,765	1,134
In bulk	do			225	90			225	90
Whole in shell	dozens	572	990	457	944			1,029	1,934
Shrimp:									
Meat:									
Cold packed	pounds	424,200	164,000	7,700	3,086			431,900	167,086
Frozen	do	3,211	1,284					3,211	1,284
Whole in shell	do	690	104					690	104
Trout:									
Fresh	do	50,962	4,534	1,500	195			52,462	4,729
Frozen	do	17,295	1,470	8,975	692			26,270	2,162
Sablefish:									
Frozen	do	776,825	23,499					776,825	23,499
Pickled	do	100,364	4,167					100,364	4,167
Livers	do	32,045	11,216					32,045	11,216
Rockfish, frozen	do	4,376	90					4,376	90
Flounders:									
Fresh	do	150,000	3,750					150,000	3,750
Frozen	do	82,145	3,300					82,145	3,300
"Lingcod":									
Fresh	do	610	10					610	10
Livers	do	1,544	618					1,544	618
Total			15,611,056		12,431,791		14,826,879		[1] 42,869,726

[1] These figures represent the value of the manufactured product. It is estimated that the value of the catch, exclusive of whales, to the fishermen was approximately $12,040,000. Of this amount, $9,943,000 was the value of the salmon catch. The round weight of the salmon catch landed by the fishermen was approximately 589,706,000 pounds, and the corresponding figure for herring was approximately 179,735,000 pounds. The cod figures given above do not include the offshore catch from waters adjacent to Alaska, which amounted to 3,065,450 pounds of dry-salted cod and 14,325 pounds of tongues, having a total value of $130,912, landed at ports of the Pacific Coast States.

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SALMON

The commercial catch of salmon in Alaska in 1938 was somewhat smaller than that of the preceding year, although well above the general average, being the fourth largest in the history of the industry. The chief decline was in the catch of pink salmon. The number of reds and cohos, on the other hand, showed a substantial increase over 1937, with the result that there was an increase in the total volume of salmon products.

Phenomenal runs of red salmon occurred in the Bristol Bay area, and the catch was the largest ever recorded for that region. This unusual abundance was attributed in part to the fact that, during the migration of the runs from the Pacific, comparatively small catches were made on the south side of the Alaska Peninsula, where unfavorable weather conditions hampered fishing operations, particularly in the early part of the season. Although the total number of red salmon taken in central Alaska was somewhat less than in 1937, there was an increase in the pack of this species, indicating a larger average size of the fish. Among the districts which showed a gain in output of canned red salmon were the Kodiak area, Cook Inlet, and Prince William Sound. There was an increase also in the various districts of southeast Alaska, except the west coast of Prince of Wales Island.

Pink salmon were less abundant than in the 2 preceding years in each of the three major districts of Alaska, although the Prince William Sound and Cook Inlet areas showed substantial gains over the production for 1937. An increase in the catch of cohos was rather generally distributed, except that no fall fishing for this species was carried on in the Copper River and Bering River areas. Fewer chum salmon were taken than in 1937, but the volume of products showed an increase. There was a decline in both the catch and pack of king salmon.

The total catch of salmon decreased about 6 percent from that for 1937. By districts, there was a decrease of about 11 percent in southeast Alaska and 14 percent in central Alaska, while in western Alaska the catch increased 19 percent.

There was a decrease of about 20 percent in the number of fathoms of seines, and an increase of about 11 percent in the number of fathoms of gill nets used in Alaska in 1938, as compared with the previous year.

Catch and Apparatus

The total number of seines used in the salmon industry in 1938 was 801, of which 646 were purse seines and 155 beach seines. The purse seines aggregated 97,310 fathoms of webbing, and the beach seines 14,419 fathoms. The number of gill nets used was 4,711, having a total length of 327,649 fathoms. There were 166 driven and 290 floating traps—a total of 456. This number includes 4 traps in the Chignik district that were installed merely to hold the locations, as well as several traps elsewhere in the Territory, termed "dummy" traps, the catches of which were negligible.

Southeastern Alaska was accredited with 447 seines, or a total of 73,475 fathoms, a decrease of 85 seines and 17,101 fathoms of webbing from the number used in 1937; also with 427 gill nets, aggregating 28,225 fathoms, an increase of 43 nets and 3,265 fathoms of webbing; and with 29 driven and 257 floating traps, a decrease of 3 driven traps

and an increase of 5 floating traps, as compared with the number operated in 1937.

Corresponding figures for central Alaska show 350 seines, or 37,054 fathoms, as compared with 455 seines, or 46,169 fathoms, in 1937; 2,072 gill nets or 128,745 fathoms, as compared with 1,537 gill nets, or 99,570 fathoms, in 1937; and 137 driven and 33 floating traps, as compared with 138 driven and 31 floating traps in 1937.

In western Alaska 4 seines, or 1,200 fathoms of webbing, were used, a decrease of 4 seines and 1,000 fathoms of webbing from the number operated in 1937. There were 2,212 gill nets used, or an aggregate of 170,679 fathoms, an increase of 148 nets but a decrease of 802 fathoms of webbing. No traps were operated in this district.

Seines caught 22 percent of the salmon taken in 1938, gill nets 30 percent, and traps 46 percent, while lines and wheels took the remaining 2 percent.

Salmon traps operated in Alaska in 1938

Licensee	Territorial License No.	Location
Southeast Alaska:		
Independent Salmon Canneries, Inc	38-001	Indian Point.
Sebastian Stuart Fish Co	38-002	Point Napean.
Ward's Cove Packing Co	38-010	Cone Point.
Deep Sea Salmon Co	38-011	Union Point.
Do	38-013	Bond Bay.
Loveless & Sons	38-017	Etolin Island.
Do	38-018	Marsh Island.
Ward's Cove Packing Co	38-019	Seal Cove.
Brindle Trap Co	38-020	Duke Point.
Ward's Cove Packing Co	38-021	Gravina Island.
Libby, McNeill & Libby	38-031	Cape Fanshaw.
Do	38-032	South of Limestone Inlet.
Do	38-033	Spasskaia Bay.
Do	38-034	Do.
Do	38-035	Do.
Do	38-036	Marble Cove.
Do	38-037	False Point Pybus.
Do	38-038	Windham Bay.
Do	38-039	Northeast of Point Pybus.
Do	38-040	Do.
Do	38-041	Cape Bendel.
Do	38-042	Fanshaw Bay.
Do	38-043	Wedge Island.
Do	38-044	Cone Island.
Do	38-045	Grindall Island.
Do	38-046	Niblack Point.
Do	38-047	Smugglers Cove.
Do	38-048	Thorne Arm.
Do	38-049	Sukkwan Island.
Do	38-050	Cape Lynch.
Do	38-051	Cap Island.
Do	38-053	San Christoval Channel.
Do	38-054	Suemez Island.
Do	38-055	Fern Point.
Do	38-056	Arucenas Point.
Do	38-057	San Christoval Channel.
J. V. Davis	38-060	Cape Bendel.
Do	38-061	Naked Island.
Do	38-062	East Point.
Peril Straits Packing Co	38-063	Cosmos Cove.
Do	38-064	Marble Bluff.
Alaska Packers Association	38-066	Tree Point.
Fidalgo Island Packing Co	38-084	South of Kingsmill Point.
Do	38-085	Do.
Do	38-086	Point Ellis.
Do	38-087	South of Kingsmill Point.
Do	38-088	Kingsmill Point.
Do	38-089	Ship Island.
Do	38-090	Point Sykes.
Do	38-091	Slate Island.
Do	38-092	Onslow Island.
Do	38-093	Lucky Cove.
H. Bergman	38-094	North of Seal Cove.

Salmon traps operated in Alaska in 1938—Continued

Licensee	Territorial License No.	Location
Southeast Alaska—Continued.		
Laura A. Houston	38-095	Point Higgins.
Peril Straits Packing Co	38-098	North of Fishery Point.
August Buschmann	38-099	Cape Addington.
Olaf A. Johnson	38-100	Warburton Island.
Peril Straits Packing Co	38-101	Peril Strait.
Do	38-102	North of Point Turbot.
Do	38-103	Tebenkof Bay.
E. R. Carlson	38-105	Sukkwan Island.
Deep Sea Salmon Co	38-106	Caamano Point.
Wm. M. Fraser	38-107	Steamer Rock.
Astoria & Puget Sound Canning Co	38-109	Pleasant Island.
Do	38-110	Big Porpoise Island.
Do	38-111	Point Adolphus.
Do	38-112	Do.
Do	38-113	Pleasant Island.
The Nakat Packing Corporation	38-114	Kanagunut Island.
Do	38-115	Sitklan Island.
Do	38-116	Cape Fox Island.
Do	38-117	Tree Point South.
Do	38-118	Breakwater South.
Do	38-119	Breakwater North.
Do	38-120	Niblack Point.
Do	38-121	Tolstoi Point.
Do	38-122	Meyers Chuck.
Do	38-123	Ernest Point.
Do	38-124	Eaton Point.
Do	38-125	Gravina Island.
Do	38-126	Point Webster.
Do	38-127	Sukkwan Island.
Do	38-128	Point Providence.
Do	38-129	Tranquil Point.
Do	38-130	Blanquizal Island.
Do	38-131	Steamboat Point.
Do	38-132	Point Desconocida.
Do	38-133	Derrumba Ridge, Heceta Id.
Arthur Gamble Co	38-134	Tree Point.
Keller Trap Co	38-135	Foggy Point.
Gravina Packing Co	38-136	Boat Rock.
Dixon Entrance Fisheries Co	38-137	Meyers Island.
August Buschmann	38-138	Warren Island.
The Nakat Packing Corporation	38-139	Cape Ulitka.
New England Fish Co	38-141	Point Thatcher.
Pacific American Fisheries, Inc	38-142	Kah Shakes.
Do	38-143	Do.
Do	38-144	Point Sykes.
Do	38-145	Point Alava.
Do	38-146	Lucky Cove.
Do	38-147	Betton Island.
Do	38-148	Escape Point.
Do	38-149	South Vallenar Point.
Do	38-150	Grindall Peninsula.
Do	38-151	Kanagunut Island.
Do	38-152	Grindall Point.
Do	38-153	False Island.
Do	38-154	Polk Island.
Do	38-155	Cleveland Peninsula.
Do	38-156	West of Point Nunez.
Do	38-157	Shipwreck Point.
Do	38-158	Kassa Inlet.
Do	38-159	Point Colpoys.
Do	38-160	East of Point Baker.
Do	38-161	Deepwater Point.
Do	38-162	Point Hobart.
Do	38-163	Point Brightman.
Do	38-164	North of Point Amelius.
Do	38-165	Totem Bay.
Do	38-166	East of Point Baker.
Do	38-167	Rocky Point.
Do	38-168	Point Gustavus.
Do	38-169	Dundas Bay.
Do	38-170	Dundas Point.
Do	38-171	Lemesurier Island.
Do	38-172	Eagle Point.
Do	38-173	Mansfield Peninsula.
Do	38-174	Gull Cove.
Security Fish Co	38-215	Security Cove.
Ira W. Kelly	38-219	Caamano Point.
Mrs. Dick Anderson	38-220	South of Windy Point.
Frank H. Murphy & Co	38-224	Cleveland Peninsula.
Peter A. Miller	38-225	Kasaan Bay.

Salmon traps operated in Alaska in 1938—Continued

Licensee	Territorial License No.	Location
Southeast Alaska—Continued.		
Hood Bay Canning Co	38-226	Killisnoo Island.
P. E. Harris & Co	38-238	North of Hawk Inlet.
Do	38-239	Do.
Do	38-240	South of Point Marsden.
Do	38-241	North shore of Icy Strait.
Do	38-242	South of Point Augusta.
Do	38-243	North of Hawk Inlet.
Do	38-244	North of Parker Point.
Deep Sea Salmon Co	38-248	Scott Point.
Do	38-249	Rip Point.
Do	38-250	Hidden Point.
F. & W. Salmon Co	38-252	Island Point.
New England Fish Co	38-257	Carlson Cove.
Do	38-258	South Wilson Cove.
Do	38-259	Cosmos Cove.
Do	38-260	Peninsula Point.
Do	38-261	Blank Point.
Do	38-262	Bronaugh Island.
Do	38-263	Nelson Cove.
Do	38-264	South Kendrick Bay.
Do	38-265	Point Adams.
J. H. Rolie & Co	38-266	South Kendrick Bay.
New England Fish Co	38-267	St. Philip Island.
Do	38-268	Turn Point, Tuxekan Island.
Do	38-269	San Fernando Island.
Do	38-270	Cape Lynch.
Do	38-271	San Christoval Channel.
Do	38-272	St. Ignace Island.
Sebastian Stuart Fish Co	38-273	South of Point Brightman.
Do	38-274	North of Point Windham.
Do	38-275	South of Point Caution.
Do	38-276	South of Point League.
Do	38-277	East of Point Gardner.
Diamond K Packing Co	38-278	Point Amelius.
Ward's Cove Packing Co	38-281	Gravina Island.
Nick Bez	38-282	Cube Point.
L. P. Dawes	38-283	Basket Bay.
Brindle Trap Co	38-284	Flag Point.
D. O. Jenkins	38-295	South of Carroll Point.
Alaska Pacific Salmon Co	38-303	Northwest of Point Augusta Light.
Do	38-304	Point Sophia.
Do	38-305	Northwest of Rocky Island Light.
Do	38-306	West of Three Hill Island.
Do	38-307	Northwest Inian Island.
Do	38-308	Dad Rock, South Inian Pass.
Do	38-309	Northeast Inian Island.
Do	38-310	Pleasant Island.
Do	38-311	South of Point Hepburn.
Do	38-312	Point Hepburn.
Do	38-313	Village Point.
Do	38-314	Mansfield Peninsula.
Do	38-315	South of Funter Bay.
Do	38-316	North of Village Point.
Do	38-317	Northwest of Rocky Island Light.
Do	38-318	False Bay.
Do	38-319	Cube Point.
Do	38-320	Square Cove.
Do	38-321	Hawk Inlet.
Martin Kildall	38-322	Cape Decision.
Do	38-323	Northeast of Cape Decision.
Ketchikan Packing Co	38-324	Southeast of South Vallenar Pt.
Do	38-325	Do.
Gravina Trap Co	38-326	Gravina Island.
Eagle Trap Co	38-327	Percy Islands.
E. Dobszinsky	38-328	Clover Passage.
Alaska Pacific Salmon Co	38-329	Herring Bay.
Do	38-330	Point Barrie.
Do	38-331	Bean Island.
Lloyd Balcom	38-334	Island Point.
R. Lindenberger	38-335	Point Garcia.
Do	38-336	Baker Island.
Lynch Bros	38-337	North of Bond Bay.
Beegle Packing Co	38-338	South of Foggy Point.
Do	38-339	Dall Head.
Do	38-340	Cape Fox.
Do	38-341	Black Island.
Scow Bay Packing Co	38-342	East of Point Baker.
Do	38-343	West of Point Baker.
Do	38-344	North of Halibut Harbor.
Do	38-345	North of Labouchere Bay.

Salmon traps operated in Alaska in 1938—Continued

Licensee	Territorial License No.	Location
Southeast Alaska—Continued.		
Harry Selig	38-346	Dall Head.
Gunderson & Sons	38-394	Screen Islands.
Do	38-395	Etolin Island.
Alaska Pacific Salmon Co	38-396	Deepwater Point.
Do	38-397	Boulder Point.
Do	38-398	Point Hobart.
Do	38-399	Northeast of Point Pybus.
Do	38-400	Canoe Point.
Do	38-401	Point Macartney.
Do	38-402	Point Brightman.
Do	38-403	Cape Fanshaw.
Do	38-404	Cornwallis Point.
Do	38-405	Southeast of Point Webster.
Do	38-406	East of Brownson Bay.
Do	38-407	McLeod Bay.
Do	38-408	Nutkwa Inlet.
Do	38-409	West of Point Nunez.
Do	38-410	Northwest of Kaigani Point.
Do	38-411	Cape Muzon.
Do	38-412	Cordova Bay.
Do	38-413	North of Cape Chacon.
Do	38-414	Ship Island.
Do	38-415	North of Cape Chacon.
Do	38-416	Gravina Island.
Do	38-417	Dall Head.
Do	38-418	Boat Harbor.
Do	38-419	Gravina Island.
Do	38-420	McLean Point.
Do	38-421	Nelson Cove.
Do	38-422	Street Island.
Do	38-423	Island Point.
Otto Bindpage	38-425	Kelp Island.
Superior Packing Co	38-426	South Passage Point.
Do	38-427	North of Parker Point.
Do	38-428	False Bay.
Do	38-429	Marble Bluff.
Do	38-430	N. W. of North Passage Point.
Lincoln Fisheries, Inc	38-431	Point Alava.
Do	38-432	Lucky Cove.
MacKenzie Fish Co	38-433	Caamano Point.
Otto Anderson	38-435	Vallenar Point.
C. D. Payne	38-436	Chasina Point.
Capp & Taylor Trap Co	38-437	Carroll Point.
James Taylor & Co	38-438	Kendrick Bay.
Anderson & Peterson Trap Co	38-439	Tongass Island.
Hugh Pinkerton	38-444	Bond Bay.
W. S. Balcom	38-445	Cape Chacon.
Pyramid Packing Co	38-447	South of Point Kakul.
Do	38-448	Bradshaw Cove.
Do	38-449	Distant Point.
Do	38-450	South of Point Kakul.
G. C. Foster	38-460	Ratz Point.
Wrangell Packing Co	38-461	Northwest of Ratz Point.
Do	38-462	Etolin Island.
Hood Bay Canning Co	38-464	Point Caution.
Do	38-465	South of Distant Point.
Do	38-466	South of Basket Bay.
Diamond K Packing Co	38-467	Northwest of Ratz Point.
Do	38-468	Narrow Point.
Do	38-469	Steamer Point.
Do	38-470	Olson Cove.
Do	38-471	Kingsmill Point.
Do	38-472	Northwest of Point Nesbitt.
Herbert Kittilsby	38-473	Observation Island.
Lester O. Gore	38-474	Brownson Bay.
Annette Island Canning Co., 8 traps		Annette Island Fishery Reserve.
Prince William Sound:		
Pacific American Fisheries, Inc	38-175	Point Freemantle.
Do	38-176	Point Woodcock.
Do	38-177	Graveyard Point.
Do	38-178	Bidarka Point.
Do	38-179	Bligh Island.
Pioneer Canneries, Inc	38-216	Do.
Do	38-217	North of Point Freemantle.
Do	38-218	Makaka Point.
Pioneer Sea Foods Co	38-221	Hinchinbrook Island.
Do	38-222	Do.
Do	38-223	Cedar Bay.

Salmon traps operated in Alaska in 1938—Continued

Licensee	Territorial License No.	Location
Prince William Sound—Continued.		
Premier Salmon Co	38-245	Port Etches.
Do	38-246	Knowles Head.
Do	38-247	Fidalgo Bay.
New England Fish Co	38-253	Johnstone Point.
Do	38-254	Gravina Point.
Do	38-255	Hawkins Cutoff.
Do	38-256	Graveyard Point.
San Juan Fishing & Packing Co	38-348	Knight Island.
Do	38-349	McLeod Harbor.
Do	38-350	Rocky Point.
Do	38-351	Point Helen.
Do	38-354	Do.
Do	38-355	Chenega Island.
Do	38-356	Squire Island.
Do	38-357	Port Chalmers.
Shepard Point Packing Co	38-362	Shelter Bay.
Do	38-363	Red Head.
Do	38-364	Port Fidalgo.
Do	38-365	Bainbridge Island.
Do	38-366	Montague Island.
Do	38-367	Do.
Do	38-368	Do.
Do	38-369	Do.
Do	38-370	Knight Island.
Copper River Packing Co	38-372	Chenega Island.
Do	38-373	Do.
Do	38-374	Do.
Do	38-375	Do.
Do	38-376	Culross Island.
King & Crooker	38-446	Hinchinbrook Island.
B. E. Lee	38-451	Granite Bay.
Cook Inlet:		
Libby, McNeill & Libby	38-022	Corea Bend.
Do	38-023	Ninilchik Point.
Do	38-024	Porcupine.
Do	38-025	Salamato.
Do	38-026	Kalifonski.
Do	38-027	Southwest of Cape Kasilof.
Do	38-028	Moose.
Do	38-029	Kustatan.
Do	38-030	Salamato.
Sig Lindgren	38-058	East shore Cook Inlet.
Anton Johnson and Harold Jonsson	38-059	Salamato Beach.
J. T. Hansen	38-065	Nikishka Bay.
Fidalgo Island Packing Co	38-076	Bluff Point.
Do	38-077	North of Salamato Creek.
Do	38-078	Do.
Do	38-079	Flat Island.
Do	38-080	South of Cape Kasilof.
Do	38-082	Nubble Point.
Do	38-083	Southwest of Point Naskowak.
Pacific American Fisheries, Inc	38-180	East shore Cook Inlet.
Do	38-181	Do.
Do	38-182	South of Salamato.
Do	38-183	North of Kenai.
Ninilchik Packing Co	38-279	Southwest of Anchor Point.
Do	38-280	Southwest of Ninilchik.
Paul A. Shadura	38-285	Kalifonski Beach.
Estate of J. A. Magill	38-287	North of Three Mile Creek.
Do	38-288	South of Three Mile Creek.
Axel Anderson	38-292	East shore Cook Inlet.
Tyonek Native Store Association	38-294	Moquawkie Reservation.
Alaska Year Round Canneries Co	38-296	Kalgin Island.
Do	38-297	Corea Bend.
Do	38-298	Clam Gulch, Kenai Peninsula.
Do	38-299	Kalgin Island.
Myrtle M. Everett	38-332	Trading Bay.
Do	38-333	Do.
E. J. Fribrock	38-377	Chisik Island.
Do	38-378	East shore Cook Inlet.
Do	38-379	Kalgin Island.
Do	38-380	East shore Cook Inlet.
Snug Harbor Packing Co	38-381	Do.
Do	38-382	Kalgin Island.
Do	38-383	Do.
Do	38-384	Point Harriet.
Cook Inlet Packing Co	38-385	North of Ninilchik River.
Do	38-386	East shore Cook Inlet.
Do	38-387	Do.

Salmon traps operated in Alaska in 1938—Continued

Licensee	Territorial License No.	Location
Cook Inlet—Continued.		
Cook Inlet Packing Co	38-388	East shore Cook Inlet.
Do	38-389	Do.
Do	38-390	Do.
Do	38-391	Do.
Kenai River Packing Co	38-392	Do.
Do	38-393	Do.
Oscar H. Vogel	38-424	Point Possession.
Al Jones	38-434	West Foreland.
Mrs. Ero Walli	38-452	North of Ninilchik River.
W. F. Brown	38-454	East shore Cook Inlet.
H. J. Emard	38-455	Southwest of Moose Point.
Do	38-456	Point Possession.
Do	38-457	North of Moose Point.
Do	38-458	Moose Point.
Emard Packing Co	38-459	McManus Point.
Kodiak Area:		
Alaska Packers Association	38-067	Miller Island.
Do	38-068	Alitak Bay.
Do	38-069	Deadman Bay.
Do	38-073	Uyak Bay.
Do	38-074	Do.
Do	38-075	Do.
Pacific American Fisheries, Inc	38-184	Deadman Bay.
Do	38-185	Alitak Bay.
Do	38-186	Do.
Do	38-187	Spiridon Bay.
Do	38-188	South of Cape Kuliuk.
San Juan Fishing & Packing Co	38-208	Malina Bay.
Do	38-209	Malina Point.
Kadiak Fisheries Co	38-210	Raspberry Island.
Do	38-211	Do.
Do	38-212	Do.
Do	38-213	Viekoda Bay.
Do	38-214	Raspberry Island.
Litnik Fish Co	38-227	Paramanof Bay.
Uganik Fisheries, Inc	38-289	Uganik Island.
Do	38-290	Raspberry Island.
Do	38-291	Uganik Island.
Bellarmine Corporation	38-293	Do.
San Juan Fishing & Packing Co	38-352	South of Broken Point.
Do	38-353	Uganik Island.
Ottar Hofstad	38-359	Cape Uyak.
Do	38-360	Cape Ugat.
Chignik Area:		
Columbia River Packers Association	38-014	Chignik Bay, near Anchorage Bay.
Do	38-015	Aniakchak Bay.
Do	38-016	Lake Bay.
Alaska Packers Association	38-070	Main Island, Chignik Lagoon.
Do	38-071	West end of Chignik Bay.
Do	38-072	Cape Kumlik.
Pacific American Fisheries, Inc	38-189	Chignik Lagoon, Humes Point.
Do	38-190	Hook Bay.
Alaska Peninsula Area:		
Alaska Southern Packing Co	38-096	Fox Cape.
Do	38-097	Kupreanof Point.
Pacific American Fisheries, Inc	38-191	Kelly Rock, Unga Island.
Do	38-192	Pinnacle, Unga Island.
Do	38-193	Seal Cape.
Do	38-195	Ikatan Bay.
Do	38-196	Do.
Do	38-197	Do.
Do	38-198	Do.
Do	38-199	Morzhovoi Bay.
Do	38-200	Vodapoini Point.
Do	38-201	Nikolaski, Moss Cape.
Do	38-202	Deer Island.
Do	38-203	Long John, North of Arch Point.
Do	38-204	Swedania Point.
Do	38-205	Dolgoi Island.
Do	38-206	Cape Tolstoi.
D. Hotovitzky	38-207	Bold Cape.
P. E. Harris & Co	38-230	Cape Horn.
Do	38-231	East Anchor Cove.
Do	38-232	Ikatan Bay.
Do	38-233	Do.
Do	38-234	Arch Point.
Do	38-235	Pavlof Bay.
Do	38-236	Do.
Do	38-237	Moss Cape.

Salmon traps operated in Alaska in 1938—Continued

Licensee	Territorial License No.	Location
Alaska Peninsula Area—Continued.		
Korovin Island Fishing & Canning Co	38-300	Korovin Island.
Alaska Pacific Salmon Co	38-301	Popof Island.
Mrs. Helene R. Mellick	38-302	Do.
Aleutian Fishing & Packing Co	38-358	San Diego, west of Guillemot Id.
Blue Fox Fish Co	38-440	Popof Island.

Summary of traps operated in Alaska in 1938, by districts

District	Number	District	Number
Southeast Alaska	286	Central Alaska—Continued.	
		Chignik Area	8
Central Alaska:		Alaska Peninsula Area	31
Prince William Sound	42		
Cook Inlet	62	Total, Central Alaska	170
Kodiak Area	27		
		Grand total	456

Percentage of salmon caught in each Alaska district, by principal forms of apparatus

Apparatus	Southeast Alaska		Central Alaska		Western Alaska	
	1937	1938	1937	1938	1937	1938
Seines	29	27	39	32	4	3
Gill nets	3	2	8	10	95	96
Traps	65	67	53	58		
Lines	3	4				
Wheels					1	1

The total catch of salmon in 1938 was 103,022,897, a decrease of 6,092,026, or about 6 percent, from the number taken in 1937. There was a decrease of 4,852,027 in southeast and 5,755,644 in central Alaska, and an increase of 4,515,645 in the western district. By species, the catch of cohos increased 1,062,707 and reds 4,377,102; while the catch of chums decreased 410,521, pinks 10,977,246, and kings 144,068.

Salmon taken in 1938, by apparatus and species, in each geographic section of Alaska

Apparatus and species	Southeast Alaska	Central Alaska	Western Alaska	Total
Seines:				
Coho, or silver	242,402	99,448		341,850
Chum, or keta	2,433,122	1,153,296	53,975	3,640,393
Pink, or humpback	7,459,317	8,971,618		16,430,935
King, or spring	21,439	1,252	5,857	28,548
Red, or sockeye	610,486	872,245	837,342	2,320,073
Total	10,766,766	11,097,859	897,174	22,761,799
Gill nets:				
Coho, or silver	257,742	192,940	6,785	457,467
Chum, or keta	25,888	128,868	972,231	1,126,987
Pink, or humpback	85,140	771,686	1,936	858,762
King, or spring	22,702	50,067	63,545	136,314
Red, or sockeye	528,428	2,369,431	25,469,437	28,367,296
Total	919,900	3,512,992	26,513,934	30,946,826

Salmon taken in 1938, by apparatus and species, in each geographic section of Alaska—Continued

Apparatus and species	Southeast Alaska	Central Alaska	Western Alaska	Total
Traps:				
Coho, or silver	910,015	530,395		1,440,410
Chum, or keta	2,097,384	1,372,829		3,470,213
Pink, or humpback	22,743,783	15,164,598		37,908,381
King, or spring	7,124	30,393		37,517
Red, or sockeye	1,396,503	3,250,171		4,646,674
Total	27,154,809	20,348,386		47,503,195
Lines:				
Coho, or silver	789,466	1,100		790,566
King, or spring	705,852			705,852
Total	1,495,318	1,100		1,496,418
Wheels:				
Chum, or keta			292,400	292,400
King, or spring			19,459	19,459
Red, or sockeye			2,800	2,800
Total			314,659	314,659
Total:				
Coho, or silver	2,199,625	823,883	6,785	3,030,293
Chum, or keta	4,556,394	2,654,993	1,318,606	8,529,993
Pink, or humpback	30,288,240	24,907,902	1,936	55,198,078
King, or spring	757,117	81,712	88,861	927,690
Red, or sockeye	2,535,417	6,491,847	26,309,579	35,336,843
Grand total	40,336,793	34,960,337	27,725,767	103,022,897

Canning

CHANGES IN CANNERIES

Few changes in business organization and operations were reported for 1938 in the Alaska salmon-canning industry. In southeast Alaska the plant of the Demmert Packing Co. at Klawak, which had been idle in the previous year, was taken over and operated by a new concern, the Spencer Packing Corp. The plant of the Nakat Packing Corp. at Hidden Inlet was again in operation, having been rebuilt since its destruction by fire in the spring of 1937.

In central Alaska the San Juan Fishing & Packing Co. purchased the Drier Bay cannery from the Alaska Pacific Salmon Co. and dismantled it during the season. The cannery of Herbert T. Domenici at Uyak, which was idle in 1937, was taken over and operated by a new organization, the Great Northern Packing Co., Inc. The Shepard Point Packing Co. used its plant at Port Ashton both for salmon canning and for herring operations, but did not operate the cannery at Shepard Point. The Kadiak Fisheries Co. completed construction of its new modern cannery at Port Bailey, about 40 miles northwest of Kodiak, in time for operation in the 1938 season. This plant was built to replace the company's cannery at Kodiak. The Anchor Line Packing Co., formerly operating a floating plant at Seldovia, established and operated a small shore cannery on Kenai River.

At the beginning of the year the Bristol Bay Packing Co. was merged into the Alaska Salmon Co., which operated only the Kvichak River plant during the season. The company's Wood River cannery was used as a saltery, and the second Kvichak River plant, to replace buildings of the Bristol Bay Packing Co. destroyed by fire in 1936,

FIGURE 1.—Typical Alaska salmon cannery.

FIGURE 2.—Completing the cleaning operation, Alaska salmon cannery.

was not completed until after the close of the fishing season. The floating plant *La Merced*, of the Alaska Southern Packing Co., operated at Uyak Bay, Kodiak Island, during part of the season, but most of its pack was prepared in the Bristol Bay district, operations being carried on at Ships Anchorage in Kvichak Bay.

NEW CANNERIES

Aside from the replacement of certain canneries by new establishments, as mentioned above, there was only one new salmon cannery in Alaska during the season. This was a floating plant operated by Lars Sagen on a small scow at Crescent River, Tuxedna Harbor. Scotty's Packing Co., at Mummy Island, which had previously engaged in the packing of clams and crabs, added canned salmon to its production this season and is included for the first time in the list of salmon canneries.

The Salt Sea Fisheries put up a small pack of salmon, as well as crab meat, at its hand cannery at Tenakee, but this is not included in the list of salmon canneries.

CANNERIES NOT OPERATED

Largely as a result of prolonged labor negotiations in the spring, which resulted in undue delay in preparation for the season's activities, several canneries did not open, and the total number operated was the smallest for any year since 1933.

Of the canneries in southeast Alaska that were operated in the previous year, the following stood idle in 1938: Berg Packing Co., Ketchikan; Deep Sea Salmon Co., Skowl Arm; Hood Bay Canning Co., Hood Bay; Hydaburg Fisheries, Inc., Hydaburg; New England Fish Co., Chatham; Pyramid Packing Co., Inc., Sitka; and Red Salmon Packers Association, Yakutat. The plant of the Kayler-Otness Co., which was burned down in the fall of 1937, was rebuilt but did not pack salmon in 1938, its operations being confined to crabs and shrimp. The Pacific American Fisheries, Inc., used its plant at Kasaan solely for canning clams that were obtained from the beaches at Massett, B. C.

In central Alaska, plants that were closed for the 1938 season were the King Cove cannery of the Pacific American Fisheries, Inc., the company's catch in this region being put up by P. E. Harris & Co. at False Pass under a joint operating agreement; the Shepard Point cannery of Shepard Point Packing Co.; the Phillips Canning Corporation at Valdez; the Zachar Bay cannery of Shelikof Packing Co., which had been leased to the Kadiak Fisheries Co. in 1937; and the Shearwater Bay plant of Kadiak Fisheries Co., all canning operations of this concern being carried on at its new plant at Port Bailey, which replaces the company's plant at Kodiak. The Kodiak cannery has been discontinued, and all the machinery has been removed. The cannery of A. N. Nilson at Portlock was destroyed by fire during the winter of 1937–38 and was not rebuilt.

The Nushagak and Ugashik plants of the Alaska Packers Association and the Wood River plant of Alaska Salmon Co. were engaged only in the production of pickled salmon in 1938. Other canneries in the western district that had operated in the previous year but were closed in 1938 were the Nushagak and Port Moller plants of Pacific

American Fisheries, Inc., and the floating plant of Western Pacific Packing Co., Egegik River.

The following plants have been dropped from the list of inactive canneries, as they have been dismantled or abandoned and are not likely to be reopened: Alaska Packers Association, Loring, Wrangell, and Kasilof; Alaska Sanitary Packing Co., Cape Fanshaw; Anderson Mercantile Co., Inc., Deep Creek; W. G. Culver, Point McManus; General Fish Co., Ocean Dock, Anchorage; Gustan & Vogel, Point Possession; Libby, McNeill & Libby, Klawak; the Nakat Packing Corporation, Ketchikan; North Coast Packing Co., Ninilchik; Pacific American Fisheries, Inc., Excursion Inlet, Ketchikan, Port Walter, Santa Ana, Chignik, and Unakwik Inlet; Point Possession Fish Co., Point Possession; Redoubt Bay Packing Co., Redoubt Bay; Harvey J. Smith, West Foreland; Spur Fish Corporation, Nikishka Bay; Sunset Packing Co., Otter Creek; John Wik, Kenai; Jake Young, Port Chatham; E. Sandvik, Swansons Creek; and San Juan Fishing & Packing Co., Drier Bay (formerly owned by Alaska Pacific Salmon Co.). The plant of E. Sandvik at Swansons Creek is now being used for pickling salmon.

The following canneries were closed during the year but may be reopened:

Southeast Alaska:

Alaska Pacific Salmon Co	Boca de Quadra.
	Chomly.
	Funter Bay.
	Pybus Bay.
Berg Packing Co	Ketchikan.
Deep Sea Salmon Co	Skowl Arm.
Hood Bay Canning Co	Hood Bay.
Hydaburg Fisheries, Inc	Hydaburg.
Lane Bros	Moira Sound.
New England Fish Co	Chatham.
Pyramid Packing Co	Sitka.
Red Salmon Packers Association	Yakutat (floating).
Seaport Salmon Co	Ketchikan.
Karl Thiele	Lake Bay.

Central Alaska:

Alaska Packers Association	Chignik.
Aleutian Fishing & Packing Co	Sand Point.
Glacier Sea Foods Co	Cordova.
Kadiak Fisheries Co	Shearwater Bay.
Ninilchik Packing Co	Ninilchik.
Pacific American Fisheries, Inc	Kenai.
	King Cove.
Phillips Canning Corporation	Valdez.
Premier Salmon Co	Stevens Creek.
Shelikof Packing Co	Zachar Bay.
Shepard Point Packing Co	Shepard Point.

Western Alaska:

Alaska Packers Association	Naknek River.
	Nushagak Bay.
	Ugashik River.
Alaska Salmon Co	Wood River.
Herendeen Bay Consolidated Canneries	Herendeen Bay.
Libby, McNeill & Libby	Lockanok.
	Nushagak.
Pacific American Fisheries, Inc	Nushagak River (2).
	Port Moller.
Red Salmon Canning Co	Naknek River.
Western Pacific Packing Co	Egegik River (floating).

TOTAL CANNERIES OPERATED

Ninety-eight canneries were operated in Alaska in 1938—39 in southeastern, 41 in central, and 18 in western Alaska—which is a decrease from the previous year of 7 for the southeastern, 3 for the central, and 5 for the western district. The floating canneries *International*, of the International Packing Co., *Memnon*, of the Columbia River Packers Association, Inc., and *La Merced*, of the Alaska Southern Packing Co., Inc., were operated in both central and western Alaska, but each is credited to only one district, the *International* to central and the other two to western Alaska.

Companies that operated traps only, the catches of which were sold or packed by other companies under joint operating arrangements, have been omitted from the following list, although for a number of years they have been included.

Companies that canned salmon in Alaska, number and location of canneries operated, and number of traps owned by each, 1938 [1]

[New canneries indicated by asterisk (*)]

Company	Canneries		Traps		
	Number	Location	Driven	Floating	Total
Southeast Alaska:					
Alaska Pacific Salmon Co.	4	Kake		11	11
		Ketchikan	3	7	10
		Port Althorp		19	19
		Rose Inlet		9	9
Annette Island Canning Co.	1	Metlakatla	1	7	8
A R B Packing Co.	1	Wrangell			
Balcom-Payne Fisheries, Inc.	1	Ketchikan			
Beegle Packing Co.	1	do	2	4	6
Burnett Inlet Salmon Co.	1	Burnett Inlet			
Consolidated Fisheries	1	Excursion Inlet	3	10	13
Diamond K Packing Co.	1	Wrangell	2	6	8
Douglas Fisheries Co., Inc.	1	Douglas			
Fidalgo Island Packing Co.	2	Bay of Pillars	5		5
		Ketchikan	2	3	5
Haines Packing Co.	1	Letnikof Cove			
P. E. Harris & Co.	1	Hawk Inlet		7	7
Icy Straits Salmon Co.	1	Hoonah			
Independent Salmon Canneries, Inc.	1	Ketchikan		1	1
Ketchikan Packing Co.	1	do		2	2
Libby, McNeill & Libby	4	Craig		8	8
		George Inlet		7	7
		Taku Harbor	5	10	15
		Yakutat			
Lindenberger Packing Co.	1	Craig			
Nakat Packing Corp., The	3	Hidden Inlet		6	6
		Union Bay		5	5
		Waterfall		9	9
New England Fish Co.	2	Ketchikan		5	5
		Noyes Island		6	6
Northern Fisheries, Inc.	1	Ketchikan			
Ocean Packing Co.	1	Klawak			
Pacific American Fisheries, Inc.	1	Petersburg	3	4	7
Peril Straits Packing Co.	1	Todd		7	7
Scow Bay Packing Co.	1	Scow Bay		4	4
Sebastian Stuart Fish Co.	1	Tyee		6	6
Spencer Packing Corp.	1	Klawak			
Superior Packing Co.	1	Tenakee		5	5
Ward's Cove Packing Co.	1	Ward Cove		3	3
Wrangell Packing Co.	1	Wrangell		2	2
Central Alaska:					
Alaska Native Consolidated Canning Co.	1	Sand Point			
Alaska Pacific Salmon Co.	1	do	3		3
Alaska Packers Association	2	Chignik	3		3
		Larsen Bay	3		3
Alaska Red Salmon Packers, Inc.	1	Halibut Bay (Carmel)			
Alaska Southern Packing Co.	1	Uyak Bay (floating)			
Alaska Year-Round Canneries Co.	1	Seldovia	4		4

See footnotes at end of table.

Companies that canned salmon in Alaska, number and location of canneries operated, and number of traps owned by each, 1938—Continued

Company	Canneries		Traps		
	Number	Location	Driven	Floating	Total
Central Alaska—Continued.					
Anchor Line Packing Co	1	Kenai River			
Chignik Packing Co	1	Chignik			
Columbia River Packers Association, Inc.	1	Ikatan Bay (floating)			
Cook Inlet Packing Co	1	Seldovia	7		7
Copper River Packing Co	1	McClure Bay		5	5
Emard Packing Co	1	Anchorage	5		5
Fidalgo Island Packing Co	1	Port Graham	7		7
General Fish Co., Inc	1	Anchorage	3		3
W. R. Gilbert Co., Inc	1	Point Whitshed			
Great Northern Packing Co., Inc	1	Uyak Bay			
Grimes Packing Co	1	Uzinki			
Gulf Packing Co	1	Cordova [2]			
Hagen & Co	1	Seward			
P. E. Harris & Co	1	False Pass	8		8
International Packing Co	1	Ikatan, Ivanof, and Volcano Bays (floating).			
Kadiak Fisheries Co	1	Port Bailey	5	1	6
Libby, McNeill & Libby	1	Kenai	10		10
Frank McConaghy Co., Inc	1	Kodiak (floating)			
New England Fish Co	1	Cordova	4		4
North Pacific Sea Foods Co	1	Swanport			
Pacific American Fisheries, Inc	2	Alitak	6		6
		Squaw Harbor	4		4
Pioneer Canneries, Inc	1	Cordova	2	1	3
Pioneer Sea Foods Co., The	1	Orca		3	3
Puget and Alaska Canning Co	1	Seldovia			
Lars Sagen	1	Crescent River (floating).*			
Sandvik Hand Cannery	1	Uganik Village			
San Juan Fishing & Packing Co	2	Port San Juan	2	6	8
		Uganik Bay	4		4
Scotty's Packing Co	1	Mummy Island [2]			
Shepard Point Packing Co	1	Port Ashton		9	9
Snug Harbor Packing Co	1	Snug Harbor	8		8
Suryan's, Inc	1	Moser Bay (floating)			
Uganik Fisheries, Inc	1	Uganik	3		3
L. Utness	1	Mountain Slough			
Washington Fish & Oyster Co., Inc	1	Port Williams			
Western Alaska:					
Alaska Packers' Association	5	Egegik River			
		Kvichak Bay (2)			
		Naknek River (2)			
Alaska Salmon Co	1	Kvichak River			
Alaska Southern Packing Co., Inc	1	Naknek (floating)			
Columbia River Packers' Association, Inc.	2	Nushagak			
		Port Moller (floating)			
International Packing Co	1	Port Moller (floating)			
Libby, McNeill & Libby	4	Egegik River			
		Ekuk			
		Koggiung			
		Libbyville			
Nakat Packing Corporation, The	1	Nakeen			
Pacific American Fisheries, Inc	2	Naknek River			
Red Salmon Canning Co	2	Naknek River			
		Ugashik River			

[1] A list of all traps operated in Alaska in 1938 appears on pp. 115 to 121 of this report.
[2] Primarily a clam cannery.

LOSSES AND DISASTERS

Property losses reported for the Alaska fisheries in 1938 amounted to $110,235, of which $45,338 represented the value of some 5,000 cases of canned red salmon lost with a lighter of the Alaska Packers Association in Kvichak Bay, and $21,000 was the value of a shipment of empty cans lost while being conveyed to the floating cannery of Suryan's, Inc. The remainder consisted chiefly of small boats and

fishing apparatus. The total reported losses in southeast Alaska amounted to $22,985; those in the central district, $34,058; and in western Alaska, $53,192.

Other losses are known to have occurred, of which records are incomplete. One small cannery, that of A. N. Nilson, at Portlock, was destroyed by fire in the winter of 1937–38, but no information is available as to its value.

The most serious disaster was the loss of the purse-seine boat *Eidsvold*, with the entire crew, somewhere in the vicinity of Dall Island.

Thirty-one lives were lost during the year—14 in southeast, 10 in central, and 7 in western Alaska. In the southeastern district 7 fishermen were drowned, 3 shoresmen and 1 transporter met death in accidents, and 2 shoresmen and 1 transporter died of disease. Two fishermen, 3 shoresmen, and 1 transporter were drowned in central Alaska, 1 fisherman and 2 shoresmen died of disease, and 1 shoresman committed suicide. In western Alaska 2 fishermen were drowned and 1 fisherman, 3 shoresmen and 1 transporter died of disease.

STATISTICS

Ninety-eight canneries were operated in Alaska in 1938, or 15 less than in the previous year. Employment was given to 22,280 persons, as compared with 24,865 in 1937, a decrease of 2,585. White employees decreased 806, natives 536, Chinese 179, Japanese 254, Filipinos 548, Mexicans 243, Puerto Ricans 3, and miscellaneous 44; while Kanakas increased 20 and Negroes 8.

The total pack of canned salmon was 6,806,998 cases, valued at $36,636,897. This is an increase of 2 percent in quantity but a decrease of about 18 percent in value from the production in 1937, when the pack amounted to 6,669,665 cases, valued at $44,547,769. Average prices of all species were considerably lower in 1938 than in the previous year.

The output of canned salmon in southeast Alaska decreased from 2,933,896 cases in 1937 to 2,713,948 cases in 1938, or 7 percent; in central Alaska the decline was from 2,216,359 cases to 2,179,765 cases, or about 2 percent; while in western Alaska the output increased from 1,519,410 cases to 1,913,285 cases, or about 26 percent. By species, in Alaska as a whole, the pack of cohos increased from 137,317 cases in 1937 to 222,321 cases in 1938, or about 62 percent; chums, from 730,832 cases to 786,753 cases, or about 8 percent; and reds from 2,106,669 cases to 2,521,233 cases, or about 20 percent; while the pack of pinks decreased from 3,625,379 cases to 3,232,878 cases, or about 11 percent; and kings from 69,468 cases to 43,813 cases, or about 37 percent.

Details are included in the following tables to show comparison of the 1938 pack with the average for the 5 preceding years, 1933 to 1937, by cases of each species and by districts. Cohos and reds show gains of 17 percent and 23 percent, respectively, over the 5-year average, while chums declined about 4 percent, pinks 7 percent, and kings 13 percent. By districts, the pack in 1938 increased approximately 2 percent over the 5-year average in central Alaska and about 41 percent in the western district, while in southeast Alaska there was a decrease of 12 percent, making a net increase of 3 percent over the 5-year average for all of Alaska.

Persons engaged, wages paid, and operating units of Alaska salmon canning industry, 1938

Item	Southeast Alaska	Central Alaska	Western Alaska	Total
PERSONS ENGAGED				
Fishermen:				
Whites	1,471	1,513	1,891	4,875
Natives	1,235	805	235	2,275
Japanese		1		1
Filipinos	6	3		9
Mexicans	2		1	3
Kanakas		2		2
Negroes	2			2
Miscellaneous [1]	2			2
Total	2,718	2,324	2,127	7,169
Shoresmen:				
Whites	2,275	1,934	1,616	5,825
Natives	1,615	763	104	2,482
Chinese	70	103	194	367
Japanese	437	151	96	684
Filipinos	1,213	971	1,082	3,266
Mexicans	6	50	324	380
Puerto Ricans		10	77	87
Kanakas	1	5	21	27
Negroes	6	26	46	78
Miscellaneous [1]	1	11	27	39
Total	5,624	4,024	3,587	13,235
Transporters:				
Whites	807	574	419	1,800
Natives	10	43		53
Chinese	1	4		5
Filipinos	1		1	2
Mexicans			4	4
Kanakas		7		7
Negroes		1	3	4
Miscellaneous [1]		1		1
Total	819	630	427	1,876
Total:				
Whites	4,553	4,021	3,926	12,500
Natives	2,860	1,611	339	4,810
Chinese	71	107	194	372
Japanese	437	152	96	685
Filipinos	1,220	974	1,083	3,277
Mexicans	8	50	329	387
Puerto Ricans		10	77	87
Kanakas	1	14	21	36
Negroes	8	27	49	84
Miscellaneous [1]	3	12	27	42
Grand total	9,161	6,978	6,141	22,280
Wages paid shoresmen	$1,629,510	$1,488,601	$1,729,144	$4,847,255
Wages paid transporters	$434,873	$367,664	$289,455	$1,091,992
OPERATING UNITS				
Plants:				
Shore canneries	39	37	16	92
Floating canneries—				
Power vessels		2	2	4
Net tonnage		2,366	4,092	6,458
Scows		2		2
Total plants operated	39	41	18	98
Vessels:				
Power, over 5 tons	495	183	73	751
Net tonnage	9,310	4,903	21,278	35,491
Launches	115	244	18	377
Power dories	31	118	32	181
Gill-net boats	103	332	943	1,378
Seine skiffs	273	279	4	556
Other rowboats and skiffs	586	593	149	1,328
Lighters and scows	196	201	121	518
Houseboats	23	2	23	48
Pile drivers	24	33	11	68
Pile pullers	3	8		11
Rigging scows	32	10		42

[1] Koreans, Chileans, Peruvians, etc.

Persons engaged, wages paid, and operating units of Alaska salmon canning industry, 1938—Continued

Item	Southeast Alaska	Central Alaska	Western Alaska	Total
Apparatus:				
Purse seines	421	221	4	646
Fathoms	71,595	24,515	1,200	97,310
Beach seines	26	109		135
Fathoms	1,880	11,012		12,892
Gill nets	422	2,031	1,523	3,976
Fathoms	28,075	126,930	150,435	305,440
Traps, driven	29	137		166
Traps, floating	257	33		290

Output and value of canned salmon in Alaska in 1938 [1]

Product	Southeast Alaska		Central Alaska		Western Alaska		Total	
	Cases	Value	Cases	Value	Cases	Value	Cases	Value
Coho, or silver:								
½-pound flat	8,930	$84,746	3,092	$27,921			12,022	$112,667
1-pound flat	2,688	18,816	157	1,072			2,845	19,888
1-pound tall	132,147	807,301	69,839	428,613	345	$1,937	202,331	1,237,851
4-pound flat			5,123	28,905			5,123	28,905
Total	143,765	910,863	78,211	486,511	345	1,937	222,321	1,399,311
Chum, or keta:								
½-pound flat	5,147	28,969	376	2,105			5,523	31,074
1-pound tall	469,306	1,681,816	250,046	907,034	59,614	216,171	778,966	2,805,021
4-pound flat			2,264	7,328			2,264	7,328
Total	474,453	1,710,785	252,686	916,467	59,614	216,171	786,753	2,843,423
Pink, or humpback:								
½-pound flat	41,691	250,497	9,091	57,515			50,782	308,012
1-pound flat			4,105	18,317			4,105	18,317
1-pound tall	1,845,078	7,094,557	1,318,415	5,006,070			3,163,493	12,100,627
4-pound flat			14,498	54,767			14,498	54,767
Total	1,886,769	7,345,054	1,346,109	5,136,669			3,232,878	12,481,723
King, or spring:								
½-pound flat	1,279	13,325	1,075	17,390			2,354	30,715
1-pound flat	1,450	11,890	4,381	40,887	280	2,580	6,111	55,357
1-pound tall	13,641	93,458	15,488	103,975	6,219	45,138	35,348	242,571
Total	16,370	118,673	20,944	162,252	6,499	47,718	43,813	328,643
Red, or sockeye:								
½-pound flat	53,802	598,554	50,618	578,628	18,222	216,029	122,642	1,393,211
1-pound flat	13,247	116,386	38,361	318,542			51,608	434,928
1-pound tall	125,542	911,488	384,267	2,850,896	1,828,605	13,928,747	2,338,414	17,691,131
4-pound flat			8,569	64,527			8,569	64,527
Total	192,591	1,626,428	481,815	3,812,593	1,846,827	14,144,776	2,521,233	19,583,797
Grand total	2,713,948	11,711,803	2,179,765	10,514,492	1,913,285	14,410,602	6,806,998	36,636,897

[1] For the purpose of affording fair comparison, all cases are put upon the common basis of 48 1-pound cans per case.

Output of canned salmon in Alaska, in cases, 1933 to 1938 [1]

BY SPECIES

Product	1933	1934	1935	1936	1937	Average for 5-year period, 1933–37	1938	Percentage increase or decrease in 1938, as compared with 5-year average
Coho, or silver:								
½-pound flat	3,367	5,785	6,822	7,309	9,625	6,582	12,022	+82.65
1-pound flat	4,657	8,283	2,833	1,335	1,204	3,662	2,845	−22.31
1-pound tall	154,544	222,049	180,522	213,656	123,610	178,876	202,331	+13.11
4-pound flat					2,878	576	5,123	+789.41
Total	162,568	236,117	190,177	222,300	137,317	189,696	222,321	+17.20
Chum, or keta:								
½-pound flat	658	2,298	1,647	1,500	5,883	2,397	5,523	+130.41
1-pound flat					39	8		−100.00
1-pound tall	658,131	738,343	851,281	1,099,583	723,815	814,231	778,966	−4.33
4-pound flat					1,095	219	2,264	+933.79
Total	658,789	740,641	852,928	1,101,083	730,832	816,855	786,753	−3.69
Pink, or humpback:								
½-pound flat	14,857	28,793	44,560	37,406	33,338	31,791	50,782	+59.74
1-pound flat		1,668	687		438	558	4,105	+635.66
1-pound tall	2,167,694	3,793,732	3,198,819	4,522,388	3,586,905	3,453,908	3,163,493	−8.41
4-pound flat					4,698	939	14,498	+1,443.98
Total	2,182,551	3,824,193	3,244,066	4,559,794	3,625,379	3,487,196	3,232,878	−7.29
King, or spring:								
½-pound flat	9,955	9,983	13,462	10,388	15,495	11,857	2,354	−80.15
1-pound flat	10,021	10,214	6,520	5,722	6,213	7,738	6,111	−21.03
1-pound tall	21,437	32,666	16,423	35,774	47,760	30,812	35,348	+14.72
Total	41,413	52,863	36,405	51,884	69,468	50,407	43,813	−13.08
Red, or sockeye:								
½-pound flat	53,638	88,051	87,498	137,219	149,424	103,166	122,642	+18.88
1-pound flat	60,052	73,430	57,693	118,090	87,654	79,384	51,608	−34.99
1-pound tall	2,066,593	2,466,535	664,355	2,247,233	1,866,176	1,862,178	2,338,414	+25.57
4-pound flat					3,415	683	8,569	+1,154.61
Total	2,180,283	2,628,016	809,546	2,502,542	2,106,669	2,045,411	2,521,233	+23.26
Grand total	5,225,604	7,481,830	5,133,122	8,437,603	6,669,665	6,589,565	6,806,998	+3.30

BY DISTRICTS AND SPECIES

Southeast Alaska:								
Coho, or silver	95,805	158,527	142,493	134,722	88,525	124,014	143,765	+15.93
Chum, or keta	424,861	394,212	540,948	778,339	503,766	528,425	474,453	−10.21
Pink, or humpback	1,478,013	2,622,362	2,200,060	2,925,144	2,143,168	2,273,750	1,886,769	−17.02
King, or spring	8,146	15,594	11,108	20,505	30,693	17,209	16,370	−4.88
Red, or sockeye	81,126	104,398	159,429	218,007	167,744	146,141	192,591	+31.78
Total	2,087,951	3,295,093	3,054,038	4,076,717	2,933,896	3,089,539	2,713,948	−12.16
Central Alaska:								
Coho, or silver	65,307	76,371	47,461	86,007	48,654	64,760	78,211	+20.77
Chum, or keta	207,879	313,233	302,123	296,188	191,610	262,207	252,686	−3.63
Pink, or humpback	704,538	1,199,872	1,044,002	1,603,584	1,482,210	1,206,841	1,346,109	+11.54
King, or spring	23,786	28,472	24,462	27,073	31,644	27,087	20,944	−22.68
Red, or sockeye	484,484	709,470	384,183	856,829	462,241	579,442	481,815	−16.85
Total	1,485,994	2,327,418	1,802,231	2,869,681	2,216,359	2,140,337	2,179,765	+1.84
Western Alaska:								
Coho, or silver	1,456	1,219	223	1,571	138	921	345	−62.54
Chum, or keta	26,049	33,196	9,857	26,556	35,456	26,223	59,614	+127.33
Pink, or humpback		1,959	4	31,066	1	6,606		−100.00
King, or spring	9,481	8,797	835	4,306	7,131	6,110	6,499	+6.37
Red, or sockeye	1,614,673	1,814,148	265,934	1,427,706	1,476,684	1,319,829	1,846,827	+39.93
Total	1,651,659	1,859,319	276,853	1,491,205	1,519,410	1,359,689	1,913,285	+40.71
Grand total	5,225,604	7,481,830	5,133,122	8,437,603	6,669,665	6,589,565	6,806,998	+3.30

[1] The number of cases has been put upon the common basis of 48 1-pound cans per case.

Relative importance of each species of canned salmon within each district in 1938

District	Coho	Chum	Pink	King	Red	Total, all species
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Southeast Alaska	5.3	17.5	69.5	0.6	7.1	100.0
Central Alaska	3.6	11.6	61.7	1.0	22.1	100.0
Western Alaska	.0	3.1	.0	.4	96.5	100.0
All Alaska	3.3	11.6	47.5	.6	37.0	100.0

Relative importance of each district in the production of each species of salmon canned in 1938

District	Coho	Chum	Pink	King	Red	Total, all species
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Southeast Alaska	64.7	60.3	58.4	37.4	7.6	39.9
Central Alaska	35.2	32.1	41.6	47.8	19.1	32.0
Western Alaska	.1	7.6	.0	14.8	73.3	28.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

Average annual price per case of 48 1-pound cans of salmon, 1928 to 1938

Product	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Coho, or silver	$7.12	$7.59	$8.26	$6.51	$4.12	$5.20	$5.23	$6.40	$6.51	$8.14	$6.29
Chum, or keta	6.06	5.35	3.60	3.19	2.79	4.12	3.65	3.83	3.58	4.62	3.61
Pink, or humpback	6.56	6.06	4.17	3.46	3.14	4.52	4.10	4.14	3.94	4.95	3.86
King, or spring	11.13	11.92	13.32	9.40	5.46	7.51	6.85	8.70	7.95	9.94	7.50
Red, or sockeye	9.41	10.71	12.57	9.20	5.61	6.71	6.72	9.32	8.38	10.12	7.77

PACK IN CERTAIN DISTRICTS

Statistics of the salmon pack are again presented for subdivisions of the three main districts of Alaska, and comparison is made with similar statistics for 1937. Where the pack at a given cannery is made up of fish from more than one district, as in the case of that at certain Cordova canneries packing fish caught both in Prince William Sound and in the Copper River area, or at various plants in southeastern Alaska which draw for their supply on the catch of more than one district, due segregation has been made in order to credit each district with the pack from salmon caught therein. These districts are described as follows:

WESTERN ALASKA

Bristol Bay.—The Bering Sea shore, east and north of the Ugashik River.

Port Moller and Herendeen Bay.—Port Moller, Herendeen Bay, and Nelson Lagoon.

CENTRAL ALASKA

Ikatan-Shumagin Islands.—False Pass, Ikatan Bay, King Cove, and the Shumagin Islands.

Chignik.—Mainland shore from Castle Cape to Cape Kunmik.

Kodiak-Afognak Islands.—Kodiak, Spruce, and Raspberry Islands.

Cook Inlet.—The shores of Cook Inlet.

Prince William Sound.—Resurrection Bay to Point Whitshed.

Copper and Bering Rivers.—Point Whitshed to Bering River.

SOUTHEASTERN ALASKA

Yakutat and Dry Bay.—Yakutat Bay to and including Dry Bay.

Icy Strait-Lynn Canal.—West coast of Baranof and Chichagof Islands, the shores of Cross Sound, Icy Strait, Lynn Canal, and Stephens Passage, south to Taku Harbor.

Chatham Strait-Frederick Sound.—Both shores of Chatham Strait and its bays from Point Augusta to Cape Ommaney, and through Frederick Sound and its bays northward to Taku Harbor, including Kake.

Sumner Strait-Dixon Entrance.—Southward from Petersburg and eastward from Port Beauclerc to Cape Chacon and Dixon Entrance, and including all shores along the mainland and intervening islands from the Stikine River to Portland Canal.

West coast, Prince of Wales Island.—Territory west and south of a line from Cape Chacon to Point Baker and Cape Ommaney.

Pack of canned salmon in Alaska in 1938, by districts [1]

District	Coho	Chum	Pink	King	Red	Total	Percentage increase or decrease from 1937
	Cases	*Cases*	*Cases*	*Cases*	*Cases*	*Cases*	
Bristol Bay	345	54,551	----------	5,446	1,772,885	1,833,227	+25.76
Port Moller and Herendeen Bay	----------	5,063	----------	1,053	73,942	80,058	+29.71
Ikatan-Shumagin Islands	21,650	128,574	367,827	1,655	57,439	577,145	−13.86
Chignik	2,254	6,792	12,071	148	35,147	56,412	−53.88
Kodiak-Afognak Islands	14,716	69,792	450,098	316	142,112	677,034	−27.48
Cook Inlet	32,745	16,260	54,894	16,060	170,725	290,684	+59.14
Prince William Sound	6,846	31,218	461,114	251	10,615	510,044	+131.65
Copper and Bering Rivers	----------	50	105	2,514	65,777	68,446	−21.84
Yakutat and Dry Bay	26,854	397	7,417	1,450	27,211	63,329	+63.57
Icy Strait-Lynn Canal	18,363	87,263	245,556	3,917	70,078	425,177	−8.35
Chatham Strait-Frederick Sound	19,083	93,879	373,982	1,348	13,346	501,638	−30.31
Sumner Strait-Dixon Entrance	48,169	212,578	912,747	585	60,956	1,235,035	+5.75
West Coast, Prince of Wales Island	31,296	80,336	347,067	9,070	21,000	488,769	−10.09
Total	222,321	786,753	3,232,878	43,813	2,521,233	6,806,998	+2.06

[1] Pack reduced to the basis of forty-eight 1-pound cans per case.

Canneries operated in Alaska in 1938, by districts

District	Canneries located in district	Canneries handling salmon taken in district
	Number	*Number*
Bristol Bay	[1] 17	17
Port Moller and Herendeen Bay	[2] 2	2
Ikatan-Shumagin Islands	[2] 6	7
Chignik	2	2
Kodiak-Afognak Islands	[1] 13	14
Cook Inlet	10	11
Prince William Sound	11	10
Copper and Bering Rivers	1	7
Yakutat and Dry Bay	1	1
Icy Strait-Lynn Canal	7	12
Chatham Strait-Frederick Sound	5	15
Sumner Strait-Dixon Entrance	19	22
West Coast, Prince of Wales Island	7	16
Total (without duplication)	98	----------

[1] Number includes 1 floating plant that was operated in more than 1 district.
[2] Number includes 2 floating plants that were operated in more than 1 district.

MILD CURING

Notwithstanding a considerable decrease in the number of troll-caught king salmon in southeast Alaska, the production of mild-cured salmon showed a marked increase over that of the preceding year. The increase was both for kings and for cohos, but chiefly the latter, which made up a larger portion of the pack than for any other year since 1929. The total output was the second largest in the history of the industry, having been exceeded only by the pack in 1927. As usual, the bulk of the product was from southeast Alaska, with a limited supply also from the western and central districts.

No enumeration of trolling boats was made by the Bureau in 1938, as no patrol vessel was available for this work at the beginning of the season. In respect to the number of fishermen, boats, and lines in southeast Alaska, therefore, the same figures are used as for the preceding year. In order to enable the securing of more accurate data regarding trolling operations in the future, it is the purpose to embody in the Alaska fishery regulations a requirement that before the commencement of commercial fishing each season the name and number of each trolling boat shall be furnished to the Bureau's local representative.

Twenty-one plants were operated in 1938 and 1,753 persons were employed, as compared with 17 plants and 1,605 persons in the previous year. There was also some production of mild-cured salmon incidental to canning and other operations.

The total output of mild-cured salmon was 6,519,200 pounds, valued at $1,278,931, an increase of 797,600 pounds in quantity and $214,587 in value over the production in 1937.

Persons engaged, wages paid, and operating units, Alaska salmon mild-curing industry, 1938

Item	Southeast Alaska	Central Alaska	Western Alaska	Total
PERSONS ENGAGED				
Fishermen:				
Whites	1,078	1	2	1,081
Natives	239	2	23	264
Total	1,317	3	25	1,345
Shoresmen:				
Whites	338			338
Natives	27		27	54
Total	365		27	392
Transporters:				
Whites	14			14
Natives			2	2
Total	14		2	16
Grand total	1,696	3	54	1,753
Wages paid shoresmen	$170,146		$3,473	$173,619
Wages paid transporters	$10,512		$300	$10,812
OPERATING UNITS				
Plants:				
Shore	15	1	2	18
Floating:				
Barges	2			2
Net tonnage	300			300
Scow			1	1
Total plants operated	17	1	3	21

Persons engaged, wages paid, and operating units, Alaska salmon mild-curing industry, 1938—Continued

Item	Southeast Alaska	Central Alaska	Western Alaska	Total
Vessels:				
Power, over 5 tons	259	1	3	263
Net tonnage	2,241	14	43	2,298
Launches	651		1	652
Power dory			1	1
Gill-net boats			9	9
Rowboats and skiffs	150		3	153
Lighters and scows	2		1	3
Houseboat	1			1
Apparatus:				
Gill nets		1	21	22
Fathoms		100	1,053	1,153
Lines	3,718	4		3,722
Wheels			3	3

Products of Alaska salmon mild-curing industry in 1938

Products	Southeast Alaska		Central Alaska		Western Alaska		Total	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
Coho, or silver	[1] 793,600	$103,218	[2] 16,800	$1,600			[3] 810,400	$104,818
King, or spring	[4] 5,550,400	1,154,029			[5] 158,400	$20,084	[6] 5,708,800	1,174,113
Total	6,344,000	1,257,247	16,800	1,600	158,400	20,084	6,519,200	1,278,931

[1] 992 tierces. [2] 21 tierces. [3] 1,013 tierces. [4] 6,938 tierces. [5] 198 tierces. [6] 7,136 tierces.

PICKLING

The output of pickled salmon in Alaska showed a marked increase over that for 1937, reaching the highest level for any year since 1926. This increase may be attributed primarily to the excellent runs of red salmon in the Bristol Bay district and to the fact that certain plants there did not engage in canning operations, owing to the undue delay in preparation for the season's activities by reason of unsettled labor conditions. Canneries that were used solely for pickling salmon were the Alaska Salmon Co.'s plant at Wood River, and the Nushagak and Ugashik plants of the Alaska Packers Association. A number of small outfits also engaged in the industry, and some pickled salmon was packed in connection with salmon canning and other branches of the fisheries.

Of the total output, 72 percent was prepared in western Alaska, about 27 percent in the central district, and somewhat less than 1 percent in the southeastern district.

There were 217 persons employed, an increase of 96 over the number reported for 1937. The total output was 1,177,685 pounds, valued at $122,421, as compared with 765,396 pounds, valued at $100,550, in the previous year.

Persons engaged, wages paid, and operating units, Alaska salmon-pickling industry, 1938

Item	Central Alaska	Western Alaska	Total
PERSONS ENGAGED			
Fishermen:			
Whites	31	40	71
Natives	8	58	66
Total	39	98	137
Shoresmen:			
Whites	1	36	37
Natives	2	38	40
Filipinos		3	3
Total	3	77	80
Grand total	42	175	217
Wages paid shoresmen	$718	$13,496	$14,214
OPERATING UNITS			
Plants:			
Shore	26	8	34
Floating—scows	2		2
Total plants operated	28	8	36
Vessels:			
Power, over 5 tons	1	8	9
Net tonnage	5	1,314	1,319
Launches	7	1	8
Power dories	12		12
Gill-net boats	3	63	66
Seine skiffs	1	1	2
Other rowboats and skiffs	29	63	92
Lighters and scows	2	12	14
Houseboats		3	3
Pile drivers		3	3
Apparatus:			
Beach seines	19		19
Fathoms	1,452		1,452
Gill nets	39	81	120
Fathoms	1,665	4,645	6,310

Products of Alaska salmon-pickling industry in 1938

Products	Southeast Alaska		Central Alaska		Western Alaska		Total	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
Coho, or silver	3,000	$240	109,900	$8,870	1,570	$236	114,470	$9,346
Chum, or keta			600	30	27,700	1,734	28,300	1,764
Pink, or humpback			1,600	110	4,100	264	5,700	374
King, or spring			8,600	1,222	23,300	2,448	31,900	3,670
Red, or sockeye	6,600	660	192,500	20,996	798,215	85,611	997,315	107,267
Total	9,600	900	313,200	31,228	854,885	90,293	1,177,685	122,421

FRESH SALMON

As in the previous year, the fresh-salmon business was confined to southeast Alaska, where it was largely incidental to other branches of the fisheries. Three dealers whose chief output was fresh salmon gave employment to 10 white shoresmen. The total products amounted to 3,817,042 pounds, valued at $291,335, as compared with 3,421,129 pounds, valued at $292,316, in 1937—an increase of about 12 percent in quantity, but a decrease of about a third of 1 percent in value. The foregoing output includes approximately 35,600 chum salmon, or 308,200 pounds, that were taken in Cholmondeley Sound during the fall season and shipped to a salmon cannery at Anacortes, Wash.

Products of Alaska fresh-salmon industry in 1938

Species	Pounds	Value
Coho, or silver	1,322,327	$95,427
Chum, or keta	635,719	12,366
Pink, or humpback	12,925	355
King, or spring	1,648,326	166,412
Red, or sockeye	197,745	16,775
Total	3,817,042	291,335

FREEZING

The production of frozen salmon in Alaska, most of which was incidental to mild curing and other branches of the fisheries, was substantially larger in 1938 than in the preceding year. Ninety-nine white shoresmen, not elsewhere recorded, were identified with this industry, receiving wages amounting to $49,926. Except for a small output incidental to trout operations at Seward, in the central district, the entire production was from southeast Alaska. The total output was 7,185,046 pounds valued at $530,951, as compared with 5,344,666 pounds valued at $431,614 in 1937—an increase of 34 percent in quantity and 23 percent in value.

Frozen salmon used as bait in the halibut fishery or as animal feed on fur farms are not included in the above figures but are shown under miscellaneous salmon products.

Products of Alaska frozen-salmon industry in 1938

Species	Pounds	Value
Coho, or silver	4,910,565	$357,875
Chum, or keta	636,444	20,553
Pink, or humpback	61,020	2,441
King, or spring	1,573,089	149,621
Red, or sockeye	3,928	461
Total	7,185,046	530,951

DRY-SALTED, DRIED, AND OTHER MISCELLANEOUS SALMON PRODUCTS

An outfit in southeast Alaska and one in the central district reported the dry-salting of salmon. Employment was given to 2 whites and 4 natives, respectively, and the output of dry-salted salmon amounted to 10,500 pounds, valued at $1,132, in southeast Alaska, and 18,000 pounds, valued at $500, in central Alaska. Other miscellaneous products in southeast Alaska consisted of 720,652 pounds of frozen salmon for bait, valued at $7,241; 61,420 pounds of frozen salmon for use as animal feed on fur farms, valued at $2,500; and 7,300 pounds of salmon eggs, valued at $365, which were shipped in brine to Seattle for use in specially prepared fish food. An output of 4,025 pounds of dried salmon, valued at $140, was reported for central Alaska.

Miscellaneous fishery products of the Yukon, Tanana, and Kuskokwim Rivers were 17,300 pounds of dry-salted salmon, valued at $1,730, and 998,000 pounds of dried salmon, valued at $71,200. Nine whites and 710 natives engaged in the fishery, and the apparatus used consisted of 238 wheels, 587 gill nets of 14,546 fathoms, 2 dories, and 50 rowboats and skiffs.

Production of dry-salted, dried, and other miscellaneous salmon products in Alaska in 1938

Products	Southeast Alaska		Central Alaska		Western Alaska		Total	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
Dry-salted:								
Coho, or silver	630	$51	18,000	$500			18,630	$551
King, or spring					17,300	$1,730	17,300	1,730
Red, or sockeye	9,870	1,081					9,870	1,081
Total	10,500	1,132	18,000	500	17,300	1,730	45,800	3,362
Dried:								
Chum, or keta			1,025	50	912,000	66,900	913,025	66,950
Pink, or humpback			3,000	90			3,000	90
King, or spring					44,000	2,200	44,000	2,200
Red, or sockeye					42,000	2,100	42,000	2,100
Total			4,025	140	998,000	71,200	1,002,025	71,340
Frozen for bait:								
Coho, or silver	9,273	128					9,273	128
Chum, or keta	630,146	6,301					630,146	6,301
Pink, or humpback	79,028	790					79,028	790
Red, or sockeye	2,205	22					2,205	22
Total	720,652	7,241					720,652	7,241
Frozen for feed on fur farms:								
Pink, or humpback	61,420	2,500					61,420	2,500
Salmon eggs for fish food	7,300	365					7,300	365
Grand total	799,872	11,238	22,025	640	1,015,300	72,930	1,837,197	84,808

BYPRODUCTS

Salmon meal and oil were prepared at a byproducts plant in southeast Alaska, and at a salmon cannery on Larsen Bay, in the central district, in connection with its canning operations. The average number of employees at the former plant was 24 white shoresmen, although approximately three times that number of persons were identified with the industry for varying periods, due to changes in the crews supplied through union hiring halls at different times during the season.

The total production in 1938 was 2,074,000 pounds of fertilizer, valued at $31,413, and 67,988 gallons of oil, valued at $15,757, as compared with 1,972,000 pounds of fertilizer, valued at $29,151, and 78,100 gallons of oil, valued at $23,956, in 1937—an increase of 5 percent in the output of fertilizer, and a decrease of about 13 percent in the output of oil.

HERRING

As in the previous year, little attention was given to the production of Scotch-cured herring in Alaska in 1938, primarily because of unfavorable market conditions. No pickled herring whatever was reported for southeastern Alaska and the pack in the central district was somewhat curtailed, while in the western district there was a considerable increase, with the result that the total output of Scotch-cured herring in the Territory was slightly larger than that for 1937. Of this output, 552,150 pounds, or 25 percent, came from the western district, while Prince William Sound produced 784,500 pounds and the Kodiak area 849,500 pounds, or 36 percent and 39 percent of the total, respectively.

Herring for bait showed a slight increase, although a shortage during the winter months made it necessary to import a supply of frozen herring from Prince Rupert.

A sharp curtailment in the production of herring meal and oil in southeast Alaska was partly offset by increases in the Prince William Sound area, but the total output of these products was considerably less than that of the preceding year. There were 17,720,922 pounds of meal and 2,406,822 gallons of oil produced in the Prince William Sound area, or about 55 percent and 53 percent, respectively, of the entire output of meal and oil in Alaska. The Kodiak area accounted for 7,190,194 pounds of meal and 1,215,370 gallons of oil, or 22 percent and 27 percent of the total, respectively, while southeast Alaska produced the remaining 7,279,394 pounds of meal and 900,921 gallons of oil, representing 23 percent and 20 percent of the total of these respective products. As in the preceding year, the figures indicate a relatively high oil content for the herring in the Kodiak area.

It was reported that the herring in the Kodiak area in 1938 arrived later than in the previous year, but finally appeared in large quantities. Most of the fishing in that district was again carried on in the vicinity of Cape Ugat and Uyak Bay.

Nineteen concerns handled herring in southeast Alaska, including 6 cold-storage plants that froze herring for bait and 8 outfits engaged solely in the production of bait herring. Five reduction plants, or 3 less than in the preceding year, were operated in the district, as follows:

Arentsen & Co	Big Port Walter.
Atlas Packing Corporation	Deep Cove.
Buchan & Heinen Packing Co	Port Armstrong.
Northwestern Herring Co	Port Conclusion.
Storfold & Grondahl Packing Co	Washington Bay.

In central Alaska nine plants manufactured herring oil and meal, a decrease of one from the number operated in the preceding year. Four of these plants also packed Scotch-cured herring and two produced some bloater stock. In addition, a small quantity of the Scotch-cured product was prepared in connection with salmon pickling in the Kodiak area. W. J. Imlach succeeded the Evans Bay Packing Co. as operator of the plant at Port Benny. The principal herring operators in central Alaska were as follows:

Saltery and reduction plants:

Apex Fish Co	Port Wakefield.
Chatham Strait Fish Co	Crab Bay.
Oceanic Fisheries Co., Inc	Port Oceanic and Port Vita.
San Juan Fishing & Packing Co	Port San Juan.

Reduction plants:

W. J. Imlach	Port Benny.
Perfection Fisheries, Inc	Thumb Bay.
Shepard Point Packing Co	Port Ashton.
Southwestern Herring, Inc	Iron Creek.

Production of pickled herring was reported by four plants in western Alaska, one of which was engaged primarily in the cod

fishery. The following were the principal operators in the western district:

Alaska Commercial Co	Unalaska.
Golovin Bay Packing Co	Golovin.
Hovland & Nesskaug	Dutch Harbor.

Studies of the life history and fluctuations in the abundance of the herring populations in Alaska were continued by Edwin H. Dahlgren and two assistants, the work being carried on in southeast Alaska and in the Prince William Sound and Kodiak areas of central Alaska.

STATISTICAL SUMMARY

There were 940 persons engaged in the herring industry in 1938, as compared with 988 in 1937. The number of plants decreased from 20 to 17. Products of the fishery were valued at $2,053,084, a decrease of $838,770, or 29 percent from 1937, when the total value was $2,891,854. Scotch-cured herring increased from 2,098,040 pounds, valued at $107,968, to 2,186,150 pounds, valued at $130,424, or about 4 percent in quantity and about 21 percent in value. Herring for bait increased from 5,238,172 pounds, valued at $48,816, to 6,143,768 pounds, valued at $61,802, or 17 percent in quantity and about 27 percent in value. Meal decreased 14 percent in quantity and about 13 percent in value, and oil decreased about 19 percent in quantity and 39 percent in value.

Persons engaged, wages paid, and operating units, Alaska herring industry, 1938

Item	Southeast Alaska	Central Alaska	Western Alaska	Total
PERSONS ENGAGED				
Fishermen:				
Whites	247	284	3	534
Natives	13		3	16
Total	260	284	6	550
Shoresmen:				
Whites	99	253	10	362
Natives		7	21	28
Total	99	260	31	390
Grand total	359	544	37	940
Wages paid shoresmen	$71,877	$164,607	$6,195	$242,679
OPERATING UNITS				
Plants, shore	5	9	3	17
Vessels:				
Power, over 5 tons	37	36		73
Net tonnage	1,242	1,636		2,878
Launches	2	2	1	5
Gill net boats			4	4
Power dory			1	1
Seine skiffs	32	35		67
Other rowboats and skiffs	9	4		13
Apparatus:				
Purse seines	37	36	3	76
Fathoms	6,157	6,240	300	12,697
Gill nets			6	6
Fathoms			510	510
Pound seines	6			6
Pounds	9			9

Products of Alaska herring industry in 1938

Item	Southeast Alaska		Central Alaska		Western Alaska		Total	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
Fresh, for bait	2,826,404	$37,865	1,250	$13			2,827,654	$37,878
Frozen, for bait	3,316,114	23,924					3,316,114	23,924
Pickled, for food:								
Scotch cure			1,634,000	97,927	552,150	$32,497	2,186,150	130,424
Norwegian cure					192,800	5,784	192,800	5,784
Roused for food (bloater stock)			261,350	6,395	155,550	6,360	416,900	12,755
Meal	7,279,394	132,032	24,911,116	417,582			32,190,510	549,614
Oil	[1] 6,756,908	267,021	[2] 27,166,440	1,025,684			[3] 33,923,348	1,292,705
Total	20,178,820	460,842	53,974,156	1,547,601	900,500	44,641	75,053,476	2,053,084

[1] 900,921 gallons. [2] 3,622,192 gallons. [3] 4,523,113 gallons.

HALIBUT

The voluntary control of production by the halibut fleet was continued in 1938, with some modifications from the previous program, in an effort to make it more effective in spreading the season's landings and maintaining favorable prices. This system was not entirely successful, and a concentration of landings in the spring was reflected in low price levels.

Regulations of the International Fisheries Commission increased the quotas for areas 2 and 3 by 1,000,000 pounds each. Fishing was discontinued more promptly than in the previous year, however, after the quota was reached. The season opened on April 1, and in areas 1 and 2 it closed at midnight July 29. The final date of clearance for halibut fishing in area 3 was September 29, and fishing in this area and in area 4 closed on October 29.

In addition to the sale of halibut and other fish livers for pharmaceutical purposes, the fishermen in 1938 had a market for halibut and sablefish viscera at 10 cents per pound, this material being used in experiments to determine the feasibility of extracting oils of a high vitamin content. It is understood that the yield of medicinal oil therefrom did not justify the expenditures, however, and that no further contract would be entered into for the purchase of viscera in 1939.

Biological studies of the Pacific halibut were continued by the International Fisheries Commission under the direction of Dr. W. F. Thompson. The schooner *Eagle* was chartered for research work in the Gulf of Alaska in the 1937–38 season.

STATISTICAL SUMMARY

Seven hundred and twenty-five persons were employed in the Alaska halibut fishery in 1938—an increase of 28 over the number reported for the preceding year; and products, exclusive of livers and viscera, amounted to 13,556,355 pounds, valued at $890,301. This production represents the total fares of the Alaska halibut fleet, which comprises all American vessels landing more than one-half of their catch in Alaska or British Columbia ports rather than in the States. Landings of halibut, exclusive of livers and viscera, in Alaska totaled 8,296,907 pounds, valued at $499,472, which include 26,000 pounds valued at $2,000 landed by Canadian vessels. In 1937 the landings of the Alaska

fleet were 13,281,681 pounds, valued at $931,629, and landings in Alaska amounted to 8,705,204 pounds, valued at $557,911. Fares of the Alaska fleet in 1938, therefore, increased 2 percent in quantity but decreased 4 percent in value from 1937. The landings in Alaska ports in 1938 decreased about 5 percent in quantity and 10 percent in value from the preceding year.

The amount of halibut livers landed by the Alaska fleet was not reported, but it was stated that there were altogether about 866,000 pounds of halibut, sablefish, "lingcod," and rockfish livers, valued at about $405,000, landed at Alaska and Pacific coast ports during 1938 by American vessels, as compared with 953,000 pounds, valued at $449,000, landed by American vessels in 1937. The estimated amount of halibut livers landed in Alaska was 133,000 pounds, valued at $66,500.

Halibut and sablefish viscera landed by the American fleet amounted to about 983,000 pounds, valued at $98,000. The estimated amount landed in Alaska was 240,787 pounds, valued at $24,079. No segregation was made according to species, but as the bulk of the product was halibut viscera, the entire amount is being included in the halibut statistics.

These statistics were compiled from data collected by the International Fisheries Commission and by agents of the Bureau.

Persons engaged, wages paid, and operating units, Alaska halibut industry, 1938

Item	Total	Item	Total
PERSONS ENGAGED		OPERATING UNITS	
Fishermen, whites	577	Vessels:	
Shoresmen:		Power, over 5 tons	110
Whites	137	Net tonnage	1,570
Natives	11	Launches	28
Total	148	Skates of lines	3,422
Grand total	725		
Wages paid shoresmen	$22,046		

Products of the Alaska halibut fishery in 1938

Products	Pounds	Value
Fresh (including local)	6,794,439	$429,448
Frozen	6,761,916	460,853
Livers [1]	133,000	66,500
Viscera [2]	240,787	24,079
Total	13,930,142	980,880

[1] The amount of livers landed by the Alaska fleet was not segregated; the quantity shown herein is the estimated amount landed in Alaska.
[2] The total includes some sablefish viscera, the amount and value of which it was impossible to segregate.

COD

Operations in the cod industry were on about the same scale as in other recent years in the Shumagin Islands region and in the vicinity of Unalaska. Twenty-six whites and two natives were reported engaged in the fishery from shore stations, including men aboard the

motor vessels *Gloria West* (59 tons) and *Sitka* (50 tons), each of which made an expedition to the westward, the latter for the purpose of experimenting with an otter trawl for the taking of cod. Products amounted to 281,138 pounds of dry-salted cod, valued at $15,218; 6,678 pounds of stockfish, valued at $878; and 725 pounds of tongues, valued at $85—a total of 288,541 pounds, valued at $16,181, as compared with 203,327 pounds, valued at $10,338, in 1937.

Three sailing vessels comprised the Bering Sea fleet, the products of which are not included with the Alaska fisheries output because the vessels operate from and land their fares in ports of the Pacific Coast States. Of these vessels, the *Wawona* (413 tons) was operated by the Robinson Fisheries Co., and the *Sophie Christenson* (570 tons) and *Charles R. Wilson* (328 tons) were operated by the Pacific Coast Codfish Co. The Union Fish Co. did not send any boats north this year.

Products of the offshore fishery were 3,065,450 pounds of dry-salted cod, valued at $129,572, and 14,325 pounds of tongues, valued at $1,340—a total of 3,079,775 pounds, valued at $130,912, as compared with 3,795,923 pounds, valued at $188,611 in 1937. The offshore fishery employed 104 persons, or 61 less than in the previous year.

WHALES

The American Pacific Whaling Co. operated only its Akutan station in Alaska during 1938, its other station at Port Hobron, Kodiak Island, standing idle. Of the 136 persons employed during the season, 125 were whites and 11 natives.

There were 5 steam whalers operated, or 1 less than the combined number for the two plants in the preceding year, and 173 whales were taken, consisting of 65 finback, 12 humpback, 33 sulphur bottom, and 63 sperm whales.

Operations in this industry continued to be controlled by the International Whaling Act and regulations issued thereunder. The regulations of October 9, 1936, were superseded by revised joint regulations of the Secretary of the Treasury and the Secretary of Commerce approved by the President on May 18, 1938. These regulations were again modified in December 1938, giving effect to a supplementary agreement drafted on June 8, 1937, at the International Whaling Conference in London. An important provision of the new agreement was the raising of the minimum-length limit of certain species that may be lawfully taken.

An officer of the Coast Guard was assigned to duty at the Akutan station during the season to enforce the provisions of the Whaling Treaty Act and the regulations. Statistical and biological data were collected by the Bureau and forwarded through the State Department to the International Bureau for Whaling Statistics, Oslo, Norway.

Whale products in 1938 amounted to 304,800 gallons of body oil, valued at $103,657; 181,900 gallons of sperm oil, valued at $54,570; 396 tons of meal from meat, valued at $15,796; and 216 tons of bone meal, valued at $5,618—a total value of $179,641, as compared with $479,121 in 1937.

CLAMS

The canning of clams in Alaska in 1938 was centered, as before, in Cordova and vicinity. Notwithstanding the fact that the clam fishery regulations had been modified to permit the taking of an additional 160,000 pounds of razor clams, or a total of 1,200,000 pounds including shells, in the Prince William Sound, Copper River, and Bering River areas during the first 6 months of the year, this limit was reached earlier than in 1937 and the spring season closed on April 23. No change was made in the fall quota of 280,000 pounds, but only limited operations were conducted after activities were resumed on August 16, and the quota was not reached. The total output from this district, therefore, was somewhat less than that of the previous year.

An analysis of the catch in the above-mentioned district indicated that at least 98 percent of the clams were mature, the majority running from 7–9 years of age, with 8-year-olds predominating. The Bureau's conservation policy has played an important part in restoring the clam beds to a good condition, and it now appears that the area can provide a larger annual pack if digging is extended to outlying grounds. Modified regulations for the ensuing year, therefore, will place a limitation on the output of certain well-known beds and will increase the limitation on the pack for the district as a whole.

Eleven operators, as follows, engaged in the canning of clams in Cordova and vicinity, this activity in some cases being incidental to the canning of salmon or of crab meat: Arctic Sanitary Packing Co. Blue Sea Packing Co., Buck Canning Co., W. R. Gilbert Co., Inc., Gulf Packing Co., E. A. Haltness, Hawkins Island Packing Co., Pioneer Canneries, Inc., Scotty's Packing Co., Sheep Bay Packing Co., and S. E. Smith Packing Co. Other operators in central Alaska were the Enterprise Sea Food Co., at Ninilchik, and the Sandvik Hand Cannery, at Uganik. The Sheep Bay Packing Co. and the Sandvik Hand Cannery packed butter clams; all other production reported for central Alaska consisted of razor clams

In southeast Alaska the plant of the Nickey Packing Co., in Tongass Narrows, prepared a limited pack of butter clams, and the Pacific American Fisheries, Inc., diverted its salmon cannery at Kasaan to clam-packing operations, the raw product for this purpose being imported from the razor clam beds at Massett, B. C.

A small production of razor clams was prepared also at Izembeck Bay, on the north shore of the Alaska Peninsula, by the Pacific Fisheries & Trading Co., in conjunction with its crab-canning activities.

There were 584 persons employed, of whom 477 were whites, 95 natives, 11 Filipinos, and 1 Japanese. The total production amounted to 40,870 cases containing 1,029,588 pounds (1,015,332 pounds of razor clams and 14,256 pounds of butter clams), valued at $252,774. This is an increase of 26 percent in quantity and 5 percent in value over the output for 1937, when clam products amounted to 816,942 pounds valued at $240,392.

Products of Alaska clam industry in 1938

Item	Cases	Pounds	Value
RAZOR CLAMS			
Minced:			
½-pound cans (48 to case)	[1] 34, 592	830, 208	$204, 830
10-ounce cans (48 to case)	4, 457	133, 710	32, 491
1-pound cans (48 to case)	119	5, 712	1, 189
Whole:			
10-ounce cans (48 to case)	1, 126	33, 780	9, 765
1-pound cans (48 to case)	234	11, 232	2, 556
20-ounce cans (24 to case)	23	690	161
Total, razor clams	40, 551	1, 015, 332	250, 992
BUTTER CLAMS			
Minced.			
½-pound cans (48 to case)	12	288	72
Whole:			
½-pound cans (48 to case)	32	768	110
1-pound cans (48 to case)	250	12, 000	1, 500
Juice:			
1-pound cans (48 to case)	25	1, 200	100
Total, butter clams	319	14, 256	1, 782
Grand total	40, 870	1, 029, 588	252, 774

[1] Of this number, 9,615 cases, valued at $57,690, were packed from clams obtained from Massett, B. C.

SHRIMP

Two plants in southeast Alaska were engaged primarily in the shrimp business: Alaskan Glacier Sea Food Co., at Petersburg, and Reliance Shrimp Co., at Wrangell. Cold-packed shrimp were also produced at the crab cannery of Dean C. Kayler, at Petersburg. which cannery was erected during the winter to replace that of Kayler-Otness, Inc., destroyed by fire in November 1937. A small production of shrimp was reported also by the Alaskan Glacier Sea Food Co., at Cordova, in conjunction with its crab-canning operations.

There were 141 persons engaged in the industry, of whom 27 were whites, 84 natives, 16 Japanese, 9 Filipinos, and 5 Mexicans. Products consisted of 431,900 pounds of cold-packed shrimp meat, valued at $167,086; 3,211 pounds of frozen shrimp meat, valued at $1,284; and 690 pounds of fresh shrimp in shell, valued at $104—a total of 435,801 pounds, valued at $168,474. Comparable figures for 1937 show a production of 463,385 pounds, valued at $164,933.

CRABS

During the year 1938, four plants in southeast Alaska and seven in the central district were engaged in the crab fishery. The A R B Packing Co. continued to operate as a separate unit its crab plant at Wrangell, which had formerly belonged to the Boardway Canning Co. Other plants in southeast Alaska were those of Dean C. Kayler, at Petersburg, and the Salt Sea Fisheries, at Tenakee, each of which was built to replace one destroyed by fire in the fall of 1937, and the plant of Oscar H. Wood, at Hoonah.

In addition to the operations carried on at its Cordova plant, the Alaskan Glacier Sea Food Co. packed crab meat at a newly equipped branch plant on Bering River. Engaged in the crab industry in the Cordova region also were the Gulf Packing Co., which packed both clams and salmon; the S. E. Smith Packing Co., primarily a clam cannery; and the Sheep Bay Packing Co.

The canning of king crabs was again carried on by the King Crab Co., at Seldovia. A limited pack of this species was prepared also by the Pacific Fisheries & Trading Co. aboard its floating plant *Tondeleyo*, which prospected for crabs in the Kodiak area and to the westward along the Alaska Peninsula.

The bulk of the season's output was canned, less than 10 percent of the total volume of crab products being made up of cold-packed meat and whole crabs in the shell.

There were 420 persons engaged in the industry, of whom 332 were whites, 61 natives, 26 Filipinos, and 1 Mexican. Products consisted of 448,761 pounds of canned crab meat (3,866 cases of 6½-ounce cans, 12,092 cases of ½-pound cans, 296 cases of 13-ounce cans, and 749 cases of 1-pound cans, 48 to the case; 224 cases of 1-pound cans, 90 to the case; and 517 cases of 20-ounce cans, 24 to the case), valued at $169,480; 2,765 pounds of cold-packed meat, valued at $1,134; 225 pounds of crab meat in bulk, sold locally, valued at $90; and 1,029 dozen whole crabs in the shell, valued at $1,934. Except for 24,312 pounds of king crab (1,013 cases of ½-pound cans), valued at $9,747, the entire production was of Dungeness crab. The total output of crab products in 1938 was 483,276 pounds, valued at $172,638, as compared with 711,318 pounds valued at $276,099 in 1937, a decrease of 32 percent in quantity and 37 percent in value.

Products of the Alaska crab industry in 1938

Product	Southeast Alaska			Central Alaska			Total		
	Number	Pounds	Value	Number	Pounds	Value	Number	Pounds	Value
DUNGENESS CRABS									
Canned:									
6½-ounce cans (48 to case)..cases	------	------	------	3,866	75,387	$34,794	3,866	75,387	$34,794
½-pound cans (48 to case)..cases	5,313	127,512	$47,817	5,766	138,384	47,314	11,079	265,896	95,131
13-ounce cans (48 to case)..cases	------	------	------	296	11,544	5,337	296	11,544	5,337
1-pound cans (48 to case)..cases	------	------	------	749	35,952	12,030	749	35,952	12,030
1-pound cans (90 to case)..cases	------	------	------	224	20,160	8,047	224	20,160	8,047
20-ounce cans (24 to case)..cases	------	------	------	517	15,510	4,394	517	15,510	4,394
Cold-packed meat: 5-pound cans	553	2,765	1,134	------	------	------	553	2,765	1,134
Crab meat in bulk..pounds	------	------	------	225	225	90	225	225	90
Whole in shell..dozen	572	15,865	990	457	15,660	944	1,029	31,525	1,934
Total, Dungeness crabs	------	146,142	49,941	------	312,822	112,950	------	458,964	162,891
KING CRABS									
Canned: ½-pound cans (48 to case) cases	60	1,440	450	953	22,872	9,297	1,013	24,312	9,747
Grand total	------	147,582	50,391	------	335,694	122,247	------	483,276	172,638

TROUT

The commercial production of Dolly Varden and steelhead trout in the Territory is small and, for the most part, incidental to other branches of the fisheries in southeast Alaska. During the 1938 season, however, 2 white fishermen in the central district were engaged in the industry. The total products were as follows: Dolly Vardens, 52,128 pounds fresh, valued at $4,712, and 20,395 pounds frozen, valued at $1,926; steelheads, 334 pounds fresh, valued at $17, and 5,875 pounds frozen, valued at $236.

MISCELLANEOUS FISHERY PRODUCTS

Fish of minor commercial importance are taken in limited quantities, chiefly in connection with the halibut fishery, and are landed in ports of Alaska and British Columbia and at Seattle. Such products landed in Alaska in 1938 were as follows: Sablefish, 776,825 pounds frozen, valued at $23,499; 100,364 pounds pickled, valued at $4,167, and 32,045 pounds of livers, valued at $11,216; rockfish, 4,376 pounds frozen, valued at $90, flounders, 150,000 pounds fresh, valued at $3,750, and 82,145 pounds frozen, valued at $3,300; "lingcod", 610 pounds fresh, valued at $10; and "lingcod" and rockfish livers, 1,544 pounds, valued at $618.

FUR-SEAL INDUSTRY

PRIBILOF ISLANDS

GENERAL ADMINISTRATIVE WORK

In 1938, 58,364 fur-seal skins were taken at the Pribilof Islands, an increase of 3,184 over the numbers taken in the preceding year. Of the skins obtained on St. Paul Island, 43,867 were removed from the animals by the stripping process and blubbered before curing. The remaining 2,215 skins from that island and the entire take of 12,282 skins from St. George Island were removed by the skinning process.

Delivery was made at Seattle to a representative of the Canadian Government of 8,755 sealskins, representing 15 percent of the season's take selected proportionately from the different sizes and grades, in accordance with provisions of the treaty of July 7, 1911. The remaining 49,609 skins were forwarded to the Fouke Fur Co. at St. Louis, Mo., for processing and sale at public auction. From the proceeds of sale of these skins, payment will be made to Japan of its share of 15 percent of the season's take, due under the fur-seal treaty.

The byproducts plant at St. Paul Island produced 30,587 gallons of oil and 178½ tons of meal from fur-seal carcasses and blubber. Except for small quantities retained at the Pribilof Islands for use as fox feed, these products were shipped to Seattle, where the oil was sold by competitive bidding and the meal was transferred to the Division of Fish Culture for feeding fish in hatcheries throughout the country.

In the 1938–39 season there were taken on the Pribilof Islands 1,029 fox pelts, consisting of 219 blue and 5 white pelts from St. Paul Island and 799 blue and 6 white pelts from St. George Island.

Sealing and foxing operations were carried on by Pribilof natives under the direction of the Bureau's staff. Approximately 80 additional natives from the mainland and Aleutian Islands were employed to assist with fur-seal activities during the summer.

On St. George Island three new cottages and a warehouse were built and concrete foundations were laid for a bunkhouse and for a small shed. Construction of a new machine shop was started on St. Paul Island. Sections of road on both islands were repaired or resurfaced, and improved roads were extended on St. George Island. Additional buildings, including a powerhouse and four overnight

FIGURE 3.—St. Paul Village, St. Paul Island, Alaska.

FIGURE 4.—Bidarrah unloading supplies from the Bureau of Fisheries vessel *Penguin* at St. George Island, Alaska.

cabins, were erected at the substation for sea-otter patrol in the western Aleutians.

During the northward migration of the fur seals and while the animals remained in Bering Sea waters, a patrol was maintained by Coast Guard vessels, which also rendered other assistance in the Bureau's work. The Navy Department detailed the U. S. S. *Vega* to carry the annual shipment of supplies from Seattle to the Pribilof Islands and to bring out the season's take of sealskins.

TRANSPORTATION OF SUPPLIES

The U. S. S. *Vega*, of the Navy, sailed from Seattle on July 29 with the annual shipment of supplies for the Pribilof Islands, which aggregated 1,290 tons of general freight, 252,181 board feet of lumber and 540 bundles of shingles for St. Paul Island and 784 tons of freight, 115,427 board feet of lumber and 500 bundles of shingles for St. George Island, a total of 2,074 tons of freight, 367,608 board feet of lumber, and 1,040 bundles of shingles. The vessel arrived at the Islands on August 6.

On the return trip to Seattle, covering the period from August 17 to August 25, the vessel brought out 58,364 sealskins, 168 tons of seal meal, 40 barrels of blubber, 217 empty steel drums, and miscellaneous freight.

Additional supplies for the Pribilof Islands were shipped during the year on the *Penguin*.

POWER VESSEL "PENGUIN"

Five round trips between Seattle and the Pribilof Islands were made by the *Penguin* in 1938, carrying passengers and supplies. In addition, the vessel performed interisland service and made trips to settlements along the Alaska Peninsula and the Aleutian Islands to transport native laborers hired for fur-seal work at the Pribilofs during the summer. Two trips were made to the western Aleutians—one in July and one in September—in connection with the sea-otter patrol. The July trip covered a period of approximately 3 weeks, during part of which time the ship's crew assisted with the construction of a powerhouse and the installation of a power plant and other equipment at the station on Amchitka Island. On the September trip to the westward, freight for the Navy Aerological Station at Kanaga was delivered en route.

A full cargo of freight, chiefly perishable foodstuffs, was carried on each trip from Seattle, and outgoing shipments from the islands included the 1937–38 take of foxskins, transported to Seattle in March, and the fur-seal oil produced at the byproducts plant on St. Paul Island, which was brought out in September and November.

The northbound voyages of the *Penguin* were as follows: Feb. 19–Mar. 11; May 2–14; June 11–24; Aug. 23–Sept. 5; and Oct. 15–30. Southbound voyages covered the following periods: Mar. 16–29; May 22–June 1; Aug. 3–14; Sept. 23–Oct. 5; and Nov. 2–14. On these voyages transportation was furnished to 76 passengers for the Bureau, including 23 employees of the Fouke Fur Co. who assisted with the season's sealing activities at the islands, and 3 persons connected with the Bureau's salmon patrol and investigations in Alaska. The vessel also transported 21 passengers for the Navy,

5 for the Office of Indian Affairs, 2 for the Coast Guard, 1 for the Bureau of Lighthouses, and 20 unofficial travelers.

The *Penguin* cruised 29,608 nautical miles during the year.

ROADS

St. Paul Island.—No new road work was undertaken on St. Paul Island during the year. About 1½ miles of the Northeast Point plank road around Big Lake was torn up and replaced with a fill of scoria. The Zapadni road was widened for a distance of approximately 800 feet. All other roads were dragged, and where necessary, resurfaced.

St. George Island.—The Staraya Artil road was extended approximately 2,000 feet, to the lake at the foot of the rookery. The Zapadni road was extended about 3,500 feet to a suitable killing ground near the rookery. About 4,000 feet of the Zapadni plank road was torn up and replaced with scoria.

BUILDINGS

St. Paul Island.—Construction of a new machine shop was started on St. Paul Island. When fully completed, this building will house all machinery and tools required in a first-class repair shop. There will also be a room for painting, another for overhauling cars, and another for stores. No other major construction work was undertaken on this island.

St. George Island.—Three additional 3-room frame cottages for natives were constructed this season. A warehouse, 20 by 50 feet, was built at Zapadni. This will permit unloading the *Penguin* during the fall and winter months, when prevailing winds often make the village landing unfavorable for long periods. Concrete foundations were poured for a new bunkhouse for Aleutian workmen and for a small shed to house the hoist used for unloading cargo at the village dock. Considerable repair work on native houses, including reshingling, was undertaken throughout the year.

BYPRODUCTS PLANT

The byproducts plant on St. Paul Island was in operation from June 20 to August 3, rendering oil and meal from 31,805 seal carcasses and 7,085 cubic feet, or about 368,420 pounds, of blubber. Total production for the season amounted to 471 barrels, or 24,252 gallons, of No. 1 oil; 115½ barrels, or 6,335 gallons, of No. 2 oil; and 357,222 pounds of meal. The foregoing quantities in gallons represent averages of 51.49 gallons per barrel of No. 1 oil and 54.85 gallons per barrel of No. 2 oil, as determined from the products sold by weight upon the basis of 7½ pounds to the gallon.

In August the supply vessel *Vega* brought to Seattle 336,612 pounds of meal, which was turned over to the Division of Fish Culture for use in fish hatcheries throughout the country. The season's output of seal oil was shipped to Seattle on the *Penguin*—400 barrels on the September voyage, and the remaining 173 barrels in November. As in the past, small quantities of oil and meal were retained at the Pribilof Islands for use as fox feed.

In November, 23,944 gallons of No. 1 fur-seal oil and 5,869.33 gallons of No. 2 oil were sold at Seattle by competitive bidding for $4,149.19. The No. 1 oil brought 15 cents a gallon and the No. 2 oil 9½ cents a gallon, or decreases of 25 percent and 37 percent, respectively, from the prices obtained for similar grades of oil in 1937. One additional barrel of No. 1 oil, containing 51.49 gallons, was sold to a New York firm at the rate of 15 cents a gallon, for use in experimental processing of sealskins. The total gross receipts for fur-seal oil produced in 1938, therefore, were $4,156.91.

NATIVES

CENSUS

On December 31, 1938, the total native population of St. Paul Island was 265, including 12 persons who were temporarily absent from the island. There were seven births and one death during the year. Three natives left the island and settled in Unalaska and one native became a permanent resident on St. George Island.

The census on St. George Island on December 31, 1938, showed a population of 169 natives, including one who moved there from St. Paul Island. There were six births and one death during the year.

The total native population of both islands at the end of 1938 was 434; an increase of eight over the census of the previous year.

MEDICAL SERVICE

The customary medical services and facilities were available to Government employees and the natives. One physician was stationed at St. Paul Island and another at St. George Island throughout the year. The general health of the natives was good, and sanitary conditions in the villages were satisfactory.

For the first time in several years a dentist was employed at the islands. He arrived at St. Paul Island on March 12, and during the remainder of the year a great deal of dental work was accomplished there and on St. George Island. Much remained to be done, however, as the teeth of the natives were in very poor condition, and the services of the dentist were continued for an indefinite period.

SCHOOLS

Schools for the native children are maintained by the Bureau on St. Paul and St. George Islands, and all children between the ages of 6 and 16 years are required to attend. Two teachers are employed on each island. Instruction is confined to elementary branches, including some manual training and home economics.

The 1937–38 school year began on September 20, 1937, on St. Paul Island and closed on May 6, 1938. School opened on September 13, 1937, on St. George Island and closed on May 13, 1938.

On St. Paul Island there were 12 girls and 26 boys enrolled in the junior school, and 18 girls and 14 boys in the senior school, a total enrollment of 70. On St. George Island 11 girls and 8 boys were in the junior school and 11 girls and 9 boys in the senior school, a total of 39 pupils.

SAVINGS ACCOUNTS

A number of the Pribilof Islands natives have savings accounts in the bank of the Washington Loan & Trust Co., Washington, D. C., on which they receive interest compounded semiannually at the rate of 2 percent. The Commissioner of Fisheries, as trustee, had custody during the year of these funds. There follows a summary of the trust account for the year 1938:

On hand Jan. 1, 1938	$4,202.04
Interest earned from Jan. 1 to Dec. 31, 1938	79.49
Total	4,281.53
Withdrawn by natives	430.97
On hand Dec. 31, 1938	3,850.56

The following is an itemized statement of the funds, setting forth the individual accounts:

Funds of the Pribilof Islands natives in the custody of the United States Commissioner of Fisheries, as trustee, December 31, 1938

Kochutin, Alexandra	$1,391.09	Merculief, Elizabeth	$74.84
Kozloff, Marina	139.85	Merculief, Erena	527.51
Lekanof, Tatiana (Merculief)	461.45	Merculief, George	114.07
Lestenkof, Michael	442.86	Pankoff, Agrippina	214.53
Merculief, Alexandra	50.05	Total	3,850.56
Merculief, Daniel	434.31		

PAYMENTS FOR TAKING FUR-SEAL SKINS

Natives of the Pribilof Islands are paid for their work in taking sealskins at specified rates per skin. The sealers on each island are divided into classes according to their skill and ability, and the collective earnings are apportioned among them, each worker in a given class receiving an equal share. Small bonuses are paid for special services.

On St. Paul Island the payments to natives in 1938 were at the rate of 60 cents per skin for the 46,082 sealskins taken, or a total of $27,649.20, and in addition $180 was paid to 2 foremen and 4 mess attendants.

Natives on St. George Island were paid at the rate of 75 cents per skin, the total in 1938 amounting to $9,211.50 for the 12,282 sealskins taken, and an additional $100 was paid to two native foremen.

Details of these payments are shown in the following table:

Payments to Pribilof Islands natives for taking fur-seal skins, calendar year 1938

Classification	St. Paul Island			St. George Island		
	Number of men	Share of each	Total	Number of men	Share of each	Total
First class	35	$500.40	$17,514.00	33	$213.75	$7,053.75
Second class	11	400.80	4,408.80	8	155.25	1,242.00
Third class	11	270.00	2,970.00	5	105.75	528.75
Fourth class	11	207.60	2,283.60	3	80.25	240.75
Fifth class	5	74.40	372.00	2	57.00	114.00
Boys' class	3	33.60	100.80	1	32.25	32.25
Foreman (additional compensation)			60.00			55.00
Do			40.00			45.00
Mess attendants, 4			80.00			
Total	76		27,829.20	52		9,311.50

PAYMENTS FOR TAKING FOX SKINS

For taking fox skins on the Pribilof Islands in the 1937–38 season the natives were paid at the rate of $5 per skin. The payments amounted to $1,230 for the 246 fox skins taken on St. Paul Island and $3,085 for the 617 skins taken on St. George Island, a total of $4,315.

FUR SEALS

KILLINGS

In 1938, 58,364 fur seals were killed, of which 46,082 were taken on St. Paul Island and 12,282 on St. George Island. Details in regard to the killings are shown in the following tabulations:

Seal killings on Pribilof Islands in 1938

ST. PAUL ISLAND

Date	Serial number of drive	Hauling ground	Skins secured
June 6	1	Reef	82
13	2	do	275
19	3	Zapadni	127
20	4	Reef and Gorbatch	631
21	5	Polovina and Half Way	109
22	6	Vostochni and Morjovi	521
23	7	Zapadni	104
24	8	Tolstoi, Lukanin, and Kitovi	349
25	9	Reef and Gorbatch	897
26	10	Polovina and Half Way	78
27	11	Vostochni and Morjovi	949
28	12	Zapadni	642
29	13	Tolstoi, Lukanin, and Kitovi	324
30	14	Reef and Gorbatch	1,370
July 1	15	Polovina and Half Way	284
2	16	Vostochni and Morjovi	1,510
3	17	Zapadni	762
4	18	Tolstoi, Lukanin, and Kitovi	905
5	19	Reef and Gorbatch	1,833
6	20	Polovina and Half Way	341
7	21	Vostochni and Morjovi	1,871
8	22	Zapadni	2,019
9	23	Tolstoi, Lukanin, and Kitovi	652
10	24	Reef and Gorbatch	1,923
11	25	Polovina and Half Way	971
12	26	Vostochni and Morjovi	2,533
13	27	Zapadni	2,213
14	28	Tolstoi, Lukanin, and Kitovi	566
15	29	Reef and Gorbatch	1,852
16	30	Polovina and Half Way	882
17	31	Vostochni and Morjovi	2,342
18	32	Zapadni	974
19	33	Tolstoi, Lukanin, and Kitovi	752
20	34	Reef and Gorbatch	2,242
21	35	Polovina and Half Way	722
22	36	Vostochni and Morjovi	2,030
23	37	Zapadni	1,203
24	38	Tolstoi, Lukanin, and Kitovi	799
25	39	Reef and Gorbatch	1,625
26	40	Polovina and Half Way	649
27	41	Vostochni and Morjovi	1,478
28	42	Zapadni	758
29	43	Tolstoi, Lukanin, and Kitovi	887
30	44	Reef and Gorbatch	821
31	45	Polovina and Half Way	396
Aug. 1	46	Vostochni and Morjovi	829
		Total	46,082

Seal killings on Pribilof Islands in 1938—Continued

ST. GEORGE ISLAND

Date	Serial number of drive	Hauling ground	Skins secured
June 11	1	North	52
14	2	Zapadni	49
16	3	North and East	133
20	4	Zapadni	38
21	5	North and Staraya Artil	74
23	6	East	124
24	7	Zapadni	74
25	8	North and Staraya Artil	249
27	9	East	179
28	10	Zapadni and South	210
29	11	North and Staraya Artil	307
July 1	12	East	246
2	13	Zapadni	278
3	14	North and Staraya Artil	479
5	15	East	410
6	16	Zapadni	137
7	17	North and Staraya Artil	476
9	18	East	458
10	19	Zapadni	148
11	20	North and Staraya Artil	908
13	21	East	688
14	22	Zapadni	235
15	23	North and Staraya Artil	805
17	24	East	620
18	25	Zapadni	378
19	26	North and Staraya Artil	783
21	27	East	544
22	28	Zapadni	171
23	29	North and Staraya Artil	669
25	30	East	567
26	31	Zapadni	101
27	32	North and Staraya Artil	521
28	33	East	320
29	34	Zapadni	44
30	35	East and Staraya Artil	807
		Total	12,282

AGE CLASSES

The age class of a male seal of the Pribilof Islands herd is determined from the length of its body. The classification was derived from measurements of a large number of pups branded in 1912 and killed in subsequent years. The limits of the various age classes are shown in the table following:

Age classes of male seals, Pribilof Islands

Age	Length	Age	Length
	Inches		*Inches*
Yearlings	Up to 36.75	4-year-olds	46 to 51.75
2-year-olds	37 to 40.75	5-year-olds	52 to 57.75
3-year-olds	41 to 45.75	6-year-olds	58 to 63.75

Ages of seals killed on Pribilof Islands, calendar year 1938

[On basis of classification shown in preceding table]

Age	St. Paul Island	St. George Island	Total
Yearling males	13		13
2-year-old males	1,431	225	1,656
3-year-old males	42,864	11,276	54,140
4-year-old males	1,642	712	2,354
5-year-old males	2		2
Cows [1]	130	69	199
Total	46,082	12,282	58,364

[1] Cows unavoidably and accidentally killed, or found dead.

Some of the seals recorded in the above tabulation as 2-year-olds and 4-year-olds probably were 3-year-olds, as not all male seals of a given age fall within the length limits assigned for the males of that age. As far as possible, the killings in 1938 were confined to 3-year-old males.

COMPUTATION OF FUR-SEAL HERD

The computation of the fur-seal herd in 1938 was made by Supt. H. J. Christoffers. As of August 10 the total of all classes was 1,872,438—a numerical increase of 33,319 over the figures for the preceding year. The detailed report will be found on pages 161 to 168 of this document. The following is a comparative statement of the numerical strength of the various elements of the fur-seal herd in the years 1927 to 1938, inclusive.

General comparison of computations of the seal herd on the Pribilof Islands, 1927 to 1938

Classes	1927	1928	1929	1930	1931	1932
Harem bulls	4,643	6,050	7,187	8,312	9,233	10,088
Breeding cows	263,566	284,725	307,491	332,084	358,642	387,320
Surplus bulls	4,827	5,285	5,207	3,963	3,291	2,893
Idle bulls	972	1,449	1,633	1,899	1,888	2,349
6-year-old males	13,450	12,857	10,399	5,612	6,553	8,154
5-year old males	16,073	13,001	7,016	8,191	10,193	11,669
4-year-old males	14,448	7,798	9,102	11,327	12,966	11,351
3-year-old males	9,730	11,133	13,639	14,871	13,198	17,849
2-year-old males	41,252	49,087	64,354	69,674	74,828	81,101
Yearling males	61,026	65,861	85,381	92,232	99,612	107,592
2-year-old cows	48,186	57,061	67,210	72,605	78,410	84,682
Yearling cows	67,131	72,481	85,417	92,247	99,626	107,593
Pups	263,566	284,725	307,491	332,084	358,642	387,320
Total	808,870	871,513	971,527	1,045,101	1,127,082	1,219,961

Classes	1933	1934	1935	1936	1937	1938
Harem bulls	10,213	10,770	11,547	12,321	13,100	13,160
Breeding cows	418,299	451,751	487,883	526,848	568,982	614,499
Surplus bulls	4,700	6,494	6,139	7,994	9,140	7,277
Idle bulls	2,341	2,282	2,535	2,733	3,031	2,125
6-year-old males	9,335	8,173	11,117	11,421	15,188	17,269
5-year-old males	10,216	13,897	14,276	18,985	21,586	18,201
4-year-old males	15,441	15,862	21,096	23,991	33,815	24,275
3-year-old males	18,216	24,770	28,165	40,170	45,891	32,278
2-year-old males	87,662	94,920	102,555	110,505	118,889	107,003
Yearling males	116,195	125,490	135,525	146,365	158,051	142,232
2-year-old cows	91,454	98,768	106,666	115,197	124,410	123,150
Yearling cows	116,197	125,490	135,526	146,365	158,054	156,470
Pups	418,299	451,751	487,883	526,848	568,992	614,499
Total	1,318,568	1,430,418	1,550,913	1,689,743	1,839,119	1,872,438

FOXES

Herds of blue foxes are maintained on St. Paul and St. George Islands which yield several hundred pelts annually. The foxes require very little care, roaming the islands at large and obtaining their food during most of the year from birds, birds' eggs, and marine life along the beaches. In the winter, when the natural supply of food is inadequate, the foxes are fed prepared rations, consisting chiefly of cereals, salted seal meat, and seal oil. During December and January the animals are trapped for their pelts or for marking and releasing as a breeding reserve.

TRAPPING SEASON OF 1938–39

In the 1938–39 season there were 1,029 fox pelts taken, of which 1,018 were blue and 11 white. Two hundred and nineteen blue and 5 white pelts were taken on St. Paul Island and 799 blue and 6 white pelts on St. George Island.

There were trapped, marked, and released for breeding stock, 53 male and 44 female foxes on St. Paul Island and 38 males and 49 females on St. George Island. The breeding reserve includes also a considerable number of animals that were not captured during the season.

REINDEER

St. Paul Island.—The estimated number of reindeer in the herd on St. Paul Island on September 30, 1938, was 1,943, of which it was estimated that 430 were the young of the season. During the year 103 animals were killed for food. Of this number, 24 were used at the Bureau mess, 50 at the Aleutian mess, 25 by St. Paul Island natives, 6 were transferred to St. George Island, and 4 were not fit for food. The herd was apparently in good condition.

St. George Island.—A count of the reindeer in the herd on St. George Island on September 30, 1938, showed 38 animals, of which 8 were fawns. No reindeer on this island were killed for food during the year.

FUR-SEAL SKINS

SHIPMENTS

Seven hundred and seventy barrels containing 58,364 fur-seal skins taken on the Pribilof Islands in 1938 were shipped on the U. S. S. *Vega* and arrived at Seattle on August 25. Forty barrels of blubber, having a gross weight of 19,838 pounds, also were brought out on the *Vega* and delivered to the Fouke Fur Co., f. o. b. Seattle, for use in the tanning of sealskins.

Delivery of 8,755 sealskins, packed in 114 barrels, was made to a representative of the Canadian Government at Seattle on August 26, in accordance with provisions of the fur-seal treaty. The remaining 49,609 skins were forwarded by freight to the Fouke Fur Co. at St. Louis, Mo., and arrived there on September 3.

SALES

Two public-auction sales of fur-seal skins taken on the Pribilof Islands were held in St. Louis in 1938—on May 2 and October 10, respectively—at which there were sold a total of 44,239 skins for a gross sum of $941,916. During the year, also, 992 sealskins taken on the Pribilof Islands were disposed of at private sales, under special authorization of the Secretary of Commerce, for a total of $22,241.68. In the following detailed statements the sales of other sealskins by the Department of Commerce for the account of the Government are included, in order that the records may be complete.

May 2, 1938.—On May 2, 1938, 19,949 Pribilof Islands fur-seal skins, dressed, dyed, and machined, were sold for $432,622.25. These skins consisted of 7,100 dyed black and 12,849 dyed safari brown.

October 10, 1938.—At the sale on October 10, 24,290 Pribilof Islands fur-seal skins were sold for $509,293.75. Of these, 24,244 dressed, dyed, and machined, brought $509,242.75, and 46 raw and partly processed skins brought $51. In addition, 3 confiscated fur-seal skins were sold raw for $1.50, making a total of $509,295.25 for fur-seal skins at this sale.

Special sales.—During the year, 992 Pribilof Islands fur-seal skins were sold under special authorization by the Department for advertising and promotional purposes, the gross sales amounting to $22,241.68. Of these skins, 563 dyed safari brown brought $11,617.88; 426 dyed black, $10,598.29; and 3 raw and partly processed skins, $25.51.

Further details in regard to the sales of sealskins by the Department of Commerce for the account of the Government in 1938 are given in the following tables:

Comparative values by sizes and grades, with percentages of each size, of Pribilof sealskins sold at public auction in 1938

Classes and sales	Grade	Number	High	Low	Average	Total	Total number	Average price	Total amount	Percentage
DYED BLACK										
Extra large:										
May 2	I and II	160	$32.25	$30.50	$31.26	$5,001.25	346	$26.51	$9,173.25	4.87
	Scarred, faulty, etc	186	24.00	22.00	22.43	4,172.00				
Oct. 10	I and II	146	29.00	26.50	28.16	4,112.00	304	25.54	7,765.00	3.12
	Scarred, faulty, etc	158	23.50	21.00	23.12	3,653.00				
Large:										
May 2	I and II	1,435	32.00	29.00	30.32	43,505.00	2,833	25.65	72,674.50	39.90
	Scarred, faulty, etc	1,398	23.50	19.00	20.87	29,169.50				
Oct. 10	I and II	1,812	26.75	24.50	25.51	46,227.25	3,394	23.79	80,737.75	34.80
	Scarred, faulty, etc	1,563	22.75	20.00	21.97	34,345.50				
	III	19	9.00	8.00	8.68	165.00				
Medium:										
May 2	I and II	1,840	24.00	20.00	22.41	41,240.00	3,683	20.24	74,555.50	51.88
	Scarred, faulty, etc	1,843	19.00	17.00	18.08	33,315.50				
Oct. 10	I and II	2,757	24.00	20.00	22.18	61,157.00	5,605	20.28	113,679.75	57.46
	Scarred, faulty, etc	2,780	20.25	17.00	18.69	51,944.75				
	III	68	9.00	8.00	8.50	578.00				
Small medium:										
May 2	I and II	135	18.00	17.50	17.74	2,395.00	238	16.47	3,920.50	3.35
	Scarred, faulty, etc	103	15.00	14.50	14.81	1,525.50				
Oct. 10	I and II	213	19.25	16.50	18.51	3,942.00	451	16.49	7,436.00	4.62
	Scarred, faulty, etc	227	15.50	14.00	14.99	3,403.00				
	III	11	9.00	8.00	8.27	91.00				
All classes:										
May 2							7,100	22.58	160,323.75	100.00
Oct. 10							9,754	21.49	209,618.50	100.00
DYED SAFARI BROWN										
Extra extra large:										
Oct. 10	I and II	6	28.50	28.50	28.50	171.00	12	25.50	306.00	.08
	Scarred, faulty, etc	6	22.50	22.50	22.50	135.00				
Extra large:										
May 2	I and II	280	29.50	27.50	28.36	7,940.00	640	24.36	15,590.00	4.98
	Scarred, faulty, etc	360	22.00	20.00	21.25	7,650.00				
Oct. 10	I and II	179	28.50	25.00	28.04	5,020.00	432	24.13	10,424.50	2.98
	Scarred, faulty, etc	250	23.25	20.00	21.54	5,385.00				
	III	3	6.50	6.50	6.50	19.50				
Large:										
May 2	I and II	2,485	30.00	24.00	27.40	68,101.25	4,795	23.93	114,721.25	37.32
	Scarred, faulty, etc	2,310	22.50	18.50	20.18	46,620.00				

Oct. 10	I and II	2,534	28.50	24.00	25.57	64,790.00	5,051	22.83	115,300.00	34.86
	Scarred, faulty, etc.	2,453	22.50	18.50	20.42	50,094.00				
	III	64	6.50	6.50	6.50	416.00				
Medium:										
May 2	I and II	3,440	23.50	20.00	21.51	73,980.00	6,560	19.51	128,000.00	51.05
	Scarred, faulty, etc.	3,120	18.50	16.50	17.31	54,020.00				
Oct. 10	I and II	3,795	23.00	20.50	21.63	82,096.50	8,138	19.63	159,774.25	56.16
	Scarred, faulty, etc.	4,245	19.50	16.75	18.15	77,060.25				
	III	98	6.50	6.25	6.30	617.50				
Small medium:										
May 2	I and II	359	19.25	17.00	17.65	6,337.25	854	16.38	13,987.25	6.6
	Scarred, faulty, etc.	495	16.00	15.00	15.45	7,650.00				
Oct. 10	I and II	444	18.00	16.50	17.39	7,721.00	857	16.13	13,819.50	5.9
	Scarred, faulty, etc.	391	15.50	15.00	15.25	5,961.00				
	III	22	6.25	6.25	6.25	137.50				
All classes:										
May 2							12,849	21.19	272,298.50	100.00
Oct. 10							14,490	20.68	299,624.25	100.00
MISCELLANEOUS										
Oct. 10	Unhaired and dressed	28	1.50	1.50	1.50	42.00	46	1.11	51.00	100.00
	Partly unhaired	13	.50	.50	.50	6.50				
	Raw	5	.50	.50	.50	2.50				

Special sales of Pribilof Islands fur-seal skins in 1938

Date	Number of skins	Description	Price per skin	Total
Jan. 31	70	Dyed black, large	$31.42	$2,199.40
Feb. 28	2	Raw salted	6.66	13.32
Mar. 31	80	Dyed black, medium	24.45	1,956.00
	80	Dyed Safari brown, medium	20.93	1,674.40
May 16	80	do	21.51	1,720.80
	40	Dyed black, medium	22.41	896.40
June 30	12	Dyed Safari brown, large	27.40	328.80
	22	Dyed Safari brown, medium	21.51	473.22
	40	Dyed black, medium	22.41	896.40
	23	Dyed Safari brown, large	27.40	630.20
	18	Dyed Safari brown, medium	21.51	387.18
July 25	35	Dyed black, large	30.32	1,061.20
July 26	1	do	21.69	21.69
	1	Dyed Safari brown, large	21.69	21.69
	1	Partly processed	12.19	12.19
Aug. 30	80	Dyed black, medium	22.41	1,792.80
Sept. 30	110	Dyed Safari brown, medium, scarred and faulty	17.31	1,904.10
	40	Dyed Safari brown, medium	21.51	860.40
Oct. 30	80	Dyed Safari brown, medium, scarred and faulty	18.15	1,452.00
	40	Dyed Safari brown, medium	21.63	865.20
Nov. 30	80	Dyed black, medium	22.18	1,774.40
	17	Dyed Safari brown, large	25.57	434.69
	20	Dyed Safari brown, medium	21.63	432.60
Dec. 14	20	do	21.63	432.60
	992			22,241.68

DISPOSITION OF FUR-SEAL SKINS TAKEN ON PRIBILOF ISLANDS

On January 1, 1938, there were on hand 68,498 fur-seal skins taken on the Pribilof Islands. Of these, 68,480 were at St. Louis, Mo., and 18 at Washington. In 1938, 58,364 fur-seal skins were taken on the Pribilof Islands, of which 8,755 were allotted to the Government of the Dominion of Canada as its share of the season's take and the remaining 49,609 were shipped to St. Louis. Of the skins on hand at the beginning of the year, 45,231 were disposed of, leaving 23,267 unsold, which, with the 49,609 from the 1938 take, make a total of 72,876 on hand on December 31, 1938. The following tables show further details in regard to fur-seal skins taken on the Pribilof Islands, as well as details in regard to other fur-seal skins under the control of the Department of Commerce:

Summary of Government-owned fur-seal skins in the custody of Fouke Fur Co., at St. Louis, Mo., calendar year 1938

Source	On hand Jan. 1	Receipts in 1938	Sales in 1938	On hand Dec. 31
Taken on Pribilof Islands:				
Calendar year 1935	3		3	
Calendar year 1936	21,574		21,569	5
Calendar year 1937	46,903		23,659	23,244
Calendar year 1938		49,609		49,609
United States' share of Japanese fur-seal skins: Season of 1937		210		210
Total	68,480	49,819	45,231	73,068

Summary of all Government-owned fur-seal skins under control of Department of Commerce, calendar year 1938

Source	On hand Jan. 1			Receipts in 1938	Disposed of in 1938		On hand Dec. 31		
	Fouke Fur Co.	Washington office	Total		Sales	Delivered to Canada	Fouke Fur Co.	Washington office	Total
Taken on Pribilof Islands:									
Calendar year 1918, held for reference purposes		7	7					7	7
Calendar year 1923		3	3					3	3
Calendar year 1924		1	1					1	1
Calendar year 1929		5	5					5	5
Calendar year 1930		2	2					2	2
Calendar year 1935	3		3		3				
Calendar year 1936	21,574		21,574		21,569		5		5
Calendar year 1937	46,903		46,903		23,659		23,244		23,244
Calendar year 1938				58,364		8,755	49,609		49,609
Miscellaneous skins held for reference purposes		4	4					4	4
United States' share of Japanese sealskins: Season of 1937				210			210		210
Total	68,480	22	68,502	58,574	45,231	8,755	73,068	22	73,090

SHIPMENT AND SALE OF FOX SKINS

The 231 blue and 15 white fox skins taken on St. Paul Island and the 616 blue and 1 white fox skins taken on St. George Island in the season of 1937–38 were shipped from the islands on the *Penguin*, sailing on March 15. The vessel reached Seattle on March 29, and the fox skins were forwarded by express to the Department's selling agents at St. Louis, Mo.

At the public auction sale in St. Louis on May 2, 1938, 501 blue and 1 white fox skins of the 1936–37 season's take were sold. The blue pelts brought $12,423.00, including $40 for one dressed skin, and the average selling price of the raw blue pelts was $24.77. The single white pelt was sold dressed for $15. One fine silvery pelt brought $85, which was the maximum price obtained for a single pelt.

On October 10, 1938, there were sold at public auction at St. Louis 423 blue and 16 white fox skins taken on the Pribilof Islands in the 1937–38 season. The blue pelts brought $10,295.00, an average of $24.34 per skin; and the white pelts sold for $216.00, or $13.50 each. The maximum price obtained was $72, for a single skin.

FUR-SEAL PATROL

UNITED STATES COAST GUARD

Vessels of the Coast Guard were again assigned by the Treasury Department to patrol waters along the route of the Alaska fur seals during their northward migration to the Pribilof Islands. Twelve cutters and patrol vessels were instrumental in enforcing the laws and regulations for the protection of fur seals and sea otters in the North Pacific and Bering Sea.

On March 15 the cutter *Onondaga* began the regular patrol of the Washington coast between the Columbia River entrance and the Strait of Juan de Fuca. Several preliminary cruises were made by

this vessel prior to March 15, and as early as February 15 50 seals were sighted off Willapa Bay. The seal patrol activities of the *Onondaga* were continued until March 26, and were supplemented by frequent cruises of the patrol boat *Atalanta* in the Strait of Juan de Fuca and along the coast of Vancouver Island from March 14 to 31.

On April 1 the cutter *Redwing* relieved the *Onondaga* and continued the patrol northward from Vancouver Island to Dixon Entrance and Clarence Strait. The *Redwing* was relieved on April 20 by the cutter *Haida*, which patrolled the waters from southeast Alaska to Kodiak until May 5.

Vessels of the Coast Guard which participated in the seal patrol in the North Pacific west of Kodiak, and in Bering Sea, were the patrol boats *Alert* and *Ariadne* from April 20 to July 1 and July 10, respectively; the cutter *Haida* from May 31 to June 29; the cutter *Spencer* from April 20 to July 31; the cutter *Shoshone* from June 15 to August 15; the patrol boat *Reliance* from July 1 to September 10; the cutter *Redwing* from August 2 to September 10; the patrol boat *Cyane* from July 5 to September 20; and the cutter *Hamilton* from July 15 to November 1. The cutter *Northland* made its regular annual cruise to the Arctic Ocean, patrolling in Bering Sea and adjacent waters from May 20 to September 20.

BUREAU OF FISHERIES

The Bureau of Fisheries vessel *Scoter* was assigned to patrol the waters off the coast of Washington, principally in the vicinity of Neah Bay, during the period of sealing operations by the native Indians. The *Scoter* maintained a patrol in this area from March 16 to April 12.

Morris Rafn and William B. Newcomb were detailed to Lapush, Wash., during the sealing season, as special agents of the Bureau to authenticate sealskins and to secure compliance with the treaty provisions which prohibit the use of firearms or motorboats in the taking of fur seals by the aborigines.

SEALING PRIVILEGES ACCORDED ABORIGINES

The North Pacific Sealing Convention of July 7, 1911, permits Indians and other aborigines dwelling on the coasts of North America to hunt for seals by primitive methods. In 1938 there were taken and duly authenticated, by officials of the respective Governments, 1,551 fur-seal skins, of which 184 were taken by Indians under the jurisdiction of the United States and 1,367 by Indians of Canada. The details are as follows:

Washington.—A total of 92 sealskins were taken at Lapush and Neah Bay by the Indians of Washington State. Four of these skins were taken from male seals and 88 from females, during the months, of March, April, and May. The skins were authenticated by A. M. Rafn and W. B. Newcomb, special agents of the Bureau, and by Mr. Guy C. Coy, Collector of Customs at Neah Bay, acting as special agent of the Bureau of Fisheries.

Alaska.—Ninety-two sealskins were taken by the natives of Sitka during April and May, and were authenticated by Bureau employees. Of these skins, 2 were from male and 90 from female seals.

British Columbia.—Indians along the British Columbia coast took 1,367 fur-seal skins in 1938, according to an official report.

FIGURE 5.—Fur-seal harems on Polovina Rookery, St. Paul Island, Alaska.

JAPANESE SEALSKINS DELIVERED TO THE UNITED STATES

Under the provisions of the fur-seal treaty of 1911, there were allotted to the United States 210 Japanese fur-seal skins, or 10 percent of the number taken by Japan on Robben Island in 1938. These skins were received by the Department's selling agents at St. Louis, Mo., on May 9, 1939.

SUBSTATION FOR SEA-OTTER PATROL

The Bureau's work for the furtherance of sea-otter investigations and patrol was continued. At the substation established on Amchitka Island in 1937, 4 additional overnight cabins, 8 by 10 feet, were built on the south side of the island at 8-mile intervals. At the camp site in Constantine Harbor a 10 by 16-foot powerhouse was constructed, and a 5-horsepower diesel engine was installed for use as a power plant. Two radio masts were erected on concrete bases, and radio antennae were strung leading to a receiving set and a transmitter. Buildings that had been erected in the previous year were given a coat of paint.

The number of sea otters counted in the vicinity of Amchitka Island in 1938 was considerably less than the estimate for the previous year. Whether the difference was due to an error in the count or to a change in the habits and distribution of the animals was not known. It is anticipated that further light will be thrown upon this problem by investigations in succeeding years.

COMPUTATION OF FUR SEALS, PRIBILOF ISLANDS, 1938

By Harry J. Christoffers

As indicated by the commercial killings, there was a satisfactory increase over the previous year in the number of 3-year-old male fur seals arriving at the Pribilof Islands in the 1938 season. A total of 54,140 3-year-olds were killed, compared with 50,800 in 1937 and 54,890 in 1935. The killings for the past several years, however, do not show a gain commensurate with an average increase of 8 percent in the size of the herd. It is evident, therefore, that during recent years the herd has not been increasing as fast as expected, in view of the increases apparent for the period from 1929 to 1931. This condition is probably due in part to insufficient additions to the breeding reserve as a result of continuing sealing operations for several days after July 23. It cannot be the entire cause, however. Unknown factors during the life of the seals at sea must have been partly the cause of the large increases from 1929 to 1931, and other unknown factors must have caused a greater loss of life at sea during more recent years. Disease or natural enemies would hardly be expected to increase directly in proportion to the growth of the herd. It would not be surprising, therefore, if there should be in any year an abnormally large increase in the number of 3-year-old males available for killing.

The St. George Island killings this year show a remarkable increase over those for the past 2 years, although only slightly more than the number killed in 1935.

During the last week of the season at St. Paul Island the 3-year-olds continued to come in increasing numbers. The number killed at that time, however, does not show the number which were available; as the rookeries were badly broken up, no seals were driven from the portions of rookeries having a considerable number of cows.

The experience this year, when a great many 3-year-olds arrived after the rookeries were broken up near the end of the season, indicates the advantage of killing 4-year-olds instead of 3-year-olds. A more definite portion of killable seals could be secured by killing from the 4-year-old class, as these animals arrive much earlier in the season. This would also result in driving a smaller number of cows, a very important point to be considered. Cows do not withstand driving to the same extent as young males. A great many of the cows driven probably die as a result of extreme exhaustion. As previously recommended, therefore, the killing of 4-year-olds still appears advisable, if it should be considered desirable from a commercial standpoint.

Through the courtesy of the Commander of the Bering Sea Patrol and the commanding officer of the Coast Guard cutter *Spencer*, an airplane made a trip from the village landing to Northeast Point and return. The plane passed over the Polovina rookeries en route and made several trips over the Northeast Point rookeries, for the purpose of ascertaining if it would be practicable to make a pup count by taking pictures from a plane. Motion pictures and still pictures were taken by the Coast Guard, but it appears that the value of such pictures in connection with a census of the fur seals is limited. The black rocks, on which most of the seals are found, are so dark that there is practically no contrast between them and the black pups. In addition, the pups are so small that they cannot be seen from a plane. The seals were not bothered in the least from the noise of the plane.

Adult sea lions, because of their light color, were easily distinguished from the plane, but all of them made a dash for the water when they heard the plane overhead.

BULLS

Insofar as possible, a count was made of all harem and idle bulls. During the counting period at St. Paul Island, harems were increasing and cows were being held in place by the active harem bulls. A couple of days of warm weather, however, caused a break-up of the St. George harems before counts could be made. It was necessary, therefore, to apply to St. George the information obtained at St. Paul, after observing the actual harem areas occupied.

On certain St. Paul rookeries harem areas were greatly extended, while on others considerably less area was covered than in the previous year. Female seals prefer to crowd together as closely as possible. Therefore, the crowded areas grow faster and contain many more seals per square foot than other portions of the rookery which would appear to be more favorable for their requirements. A cow prefers to enter a large harem rather than to go to a bull with only a few cows or none at all. The favored harems finally become so large that the cows must enter another bull's domain. Then the unfavored one soon accumulates a much larger number.

This year, it will be noted, there was practically no increase in the number of harem bulls and there was a marked reduction in the num-

ber of idle bulls on rookeries. The reduced number of idle bulls was very noticeable from the beginning of the season. Very few surplus bulls took up idle-bull positions, and no trouble was experienced in making an accurate count of the idle bulls. The number recorded for St. Paul Island, therefore, is quite accurate. There appeared to be the usual number of full-grown, strong, and active surplus bulls on the hauling grounds, but they were not interested in taking up idle-bull positions. Though the shortage of idle bulls was very noticeable, it is not necessarily a matter of great importance, as there is no difference between an idle and a surplus bull except in the position he occupies. They may change places continually throughout the season. Usually, however, as soon as the idle bulls secure harems, surplus bulls move over from the hauling grounds to become idle bulls, so that there are always about the same number of idle bulls in the rear of the rookeries.

It is interesting to note that 3 bulls branded in 1923 were observed—1 on Polovina Cliffs rookery and 2 on Reef rookery. All were husky animals and held large harems in the center of the rookeries.

The decrease in the expected number of harem and idle bulls might possibly be due to the final dying off of the extra males reserved from 1923 to 1932. If so, there is a possibility of a shortage of bulls within the next few years. If the number of harem and idle bulls continues to decrease, it would be advisable each year to make an additional reserve of males.

Estimated number of harem and idle bulls, approximate ratio of idle bulls to harem bulls, and average harem, 1938

Rookery	Date	Harem bulls	Idle bulls	Total	Approximate ratio of idle bulls to harem bulls	Average harem
St. Paul Island:						
Kitovi	July 19	414	51	465	1:8	49.11
Lukanin	do	183	32	215	1:6	53.71
Gorbatch	July 20	1,050	211	1,261	1:5	49.16
Ardiguen	do	96	17	113	1:6	50.86
Reef	do	2,100	308	2,408	1:7	49.38
Sivutch	do	475	60	535	1:8	66.80
Lagoon	do	2		2		26.50
Tolstoi	July 19	1,200	163	1,363	1:7	50.86
Zapadni	July 18	1,000	178	1,178	1:6	58.66
Little Zapadni	do	576	103	679	1:6	51.91
Zapadni Reef	do	69	17	86	1:4	15.03
Polovina	July 17	464	112	576	1:4	45.44
Polovina Cliffs	do	369	88	457	1:4	31.28
Little Polovina	do	120	29	149	1:4	35.03
Morjovi	do	202	54	356	1:6	25.02
Vostochni	do	2,300	364	2,664	1:6	36.57
Total		10,720	1,787	12,507	1:6	46.76
St. George Island:						
North	July 23	800	73	873	1:11	51.13
Staraya Artil	do	650	100	750	1:7	47.42
Zapadni	do	230	50	280	1:5	18.91
South	do	150	10	160	1:15	6.81
East Reef	do	185	35	220	1:5	50.66
East Cliffs	do	425	70	495	1:6	62.97
Total		2,440	338	2,778	1:7	46.41
Total (both islands)		13,160	2,125	15,285	1:6	46.69

A shortage of bulls will cause a reduction in the yearly rate of increase of pups. A larger number of surplus bulls can do no harm, except to make it a little more difficult to drive. If previous experience in reserving should be repeated, the increases of killable seals secured through making extra reserves would more than pay for itself within the next 5 years.

The albino bull, first observed in 1935, frequented the idle-bull area back of Reef rookery the greater part of the season. At no time was he observed with any cows.

AVERAGE HAREM

The average harem is computed from the estimated number of cows and harem bulls. This year's figures indicate an increase in the average harem from 43.43 in 1937 to 46.69 in 1938. This increase should not cause any great concern, although a lower average harem would be preferable, as it would show that there were more than sufficient bulls.

It is felt that the more bulls there are on hand the faster the herd will increase. An extra large number of bulls does not now necessarily create a much smaller average harem. It would mean that as the season advances and the harem bulls become exhausted, or at least weaker, their places would be taken by stronger bulls not worn out from harem duties. The present system does not provide for any considerable replacement of harem bulls during the active breeding season.

Computation of breeding cows, based on annual increase of 8 percent, and of average harem, in 1938

Rookery	Breeding cows		Harem bulls, 1938	Average harem		
	1937	1938		1938	1937	Increase (+) or decrease (−) in 1938 from 1937
St. Paul Island:						
Kitovi	18,824	20,330	414	49.11	40.05	+9.06
Lukanin	9,101	9,829	183	53.71	41.94	+11.77
Gorbatch	47,796	51,620	1,050	49.16	47.80	+1.36
Ardiguen	4,521	4,883	96	50.86	42.25	+8.61
Reef	96,007	103,688	2,100	49.38	50.53	−1.15
Sivutch	29,379	31,729	475	66.80	65.29	+1.51
Lagoon (actual count pups)	51	53	2	26.50	25.50	+1.00
Tolstoi	56,516	61,037	1,200	50.86	47.09	+3.77
Zapadni	54,314	58,659	1,000	58.66	47.23	+11.43
Little Zapadni	27,686	29,901	576	51.91	46.14	+5.77
Zapadni Reef	960	1,037	69	15.03	15.24	−.21
Polovina	19,520	21,082	464	45.44	44.87	+.57
Polovina Cliffs	10,688	11,543	369	31.28	30.54	+.74
Little Polovina	3,892	4,203	120	35.03	32.43	+2.60
Morjovi	6,996	7,556	302	25.02	21.53	+3.49
Vostochni	77,883	84,114	2,300	36.57	33.86	+2.71
Total	464,134	501,264	10,720	46.76	43.42	+3.34
St. George Island:						
North	37,877	40,907	800	51.13	46.19	+4.94
Staraya Artil	28,539	30,822	650	47.42	43.91	+3.51
Zapadni	4,027	4,349	230	18.91	20.13	−1.22
South	945	1,021	150	6.81	6.43	+.38
East Reef	8,679	9,373	185	50.66	49.88	+.78
East Cliffs	24,781	26,763	425	62.97	59.00	+3.97
Total	104,848	113,235	2,440	46.41	43.49	+2.92
Total (both islands)	568,982	614,499	13,160	46.69	43.43	+3.26

When man did not interfere and all males grew to maturity, a harem bull would be replaced after a short period of service by a stronger bull. This resulted in a stronger and better race and undoubtedly caused every cow to be properly served, with a resulting higher birth rate and possibly a smaller mortality rate.

On newly inhabited areas most of the harems were quite large. Below Hutchinsons Hill a single harem, covering a large area, contained at one time over a hundred cows. There were numerous strong, husky bulls without cows a short distance from the harem, but none of them seemed interested in securing any of the cows from this particular harem.

PUPS AND COWS

The number of pups and cows was determined by applying the average rate of increase secured through actual pup counts made from 1917 to 1922. It is difficult to say whether there was an actual increase of approximately 8 percent, but observations would indicate that this estimate is somewhat high. The harems now cover such large areas that a normal increase in cows would not necessarily be readily observed from year to year, but should be easily discernible over a period of years. From year to year one area may show a large increase or a considerable decrease, as movements are not constant in any particular place.

Distribution of pups on the Pribilof Islands, Aug. 10, 1938, and comparison with distribution in 1937

Rookery	1938				Total pups, 1937	Increase, 1938
	Living pups	Dead pups	Total pups	Percent dead pups		
St. Paul Island:						
Kitovi	20,031	299	20,330	1.47	18,824	1,506
Lukanin	9,616	213	9,829	2.17	9,101	728
Gorbatch	51,176	444	51,620	.86	47,796	3,824
Ardiguen	4,766	117	4,883	2.39	4,521	362
Reef	102,174	1,514	103,688	1.46	96,007	7,681
Sivutch	30,955	774	31,729	2.44	29,379	2,350
Lagoon	53		53		51	2
Tolstoi	60,189	848	61,037	1.39	56,516	4,521
Zapadni	57,650	1,009	58,659	1.72	54,314	4,345
Little Zapadni	29,153	748	29,901	2.50	27,686	2,215
Zapadni Reef	1,029	8	1,037	.80	960	77
Polovina	20,759	323	21,082	1.53	19,520	1,562
Polovina Cliffs	11,329	214	11,543	1.85	10,688	855
Little Polovina	4,098	105	4,203	2.51	3,892	311
Morjovi	7,403	153	7,556	2.02	6,996	560
Vostochni	82,364	1,750	84,114	2.08	77,883	6,231
Total	492,745	8,519	501,264	1.70	464,134	37,130
St. George Island:						
North	40,334	573	40,907	1.40	37,877	3,030
Staraya Artil	30,027	795	30,822	2.58	28,539	2,283
Zapadni	4,300	49	4,349	1.12	4,027	322
South	1,003	18	1,021	1.72	945	76
East Reef	9,231	142	9,373	1.51	8,679	694
East Cliffs	26,364	399	26,763	1.49	24,781	1,982
Total	111,259	1,976	113,235	1.74	104,848	8,387
Total (both islands)	604,004	10,495	614,499	1.71	568,982	45,517

The number of dead pups did not appear to be proportionately any greater this year than in the past, but the evidence available is not conclusive. To anyone observing the great activity on closely crowded harem areas it would seem highly probable that the death rate of pups is somewhat greater than indicated. The pups in the front portions of the rookeries have in many places a long way to travel to reach the rear of the areas occupied by active harem bulls.

It was quite surprising to note the number of old cows in heat at the end of the season. Many of them had pups recently born. Theoretically the older cows should be bred the first part of the season. If not bred at the proper time they would no doubt come in heat a second time. This would result in the pup being born the following year at a later date than would be normal for the age of the cow.

MORTALITY OF SEALS AT SEA

Considering the number of killable seals at the Pribilof Islands in the last few years, as well as general observations regarding the number of older bachelors and surplus bulls on the hauling grounds, it is advisable to increase the mortality rates of pups at sea. Accordingly, there have again been applied the mortality rates for pups which were used in 1925 and which were continued until 1929, when, as a result of additional reserves made in 1923 and 1924, the number of 3-year-old seals returning to the islands was so great that it was necessary to reduce these mortality rates. If present conditions do not improve, it will be necessary to increase mortality rates for several other ages of male seals and to reduce the percentage increase of pups and cows. There is a strong possibility that the mortality rates increase with the growth of the herd. However, past experience would indicate that the decrease in the rate of growth of the herd is more likely to be directly comparable to the percentage of animals killed. Observations indicated it was advisable to apply the larger mortality rate for pups to all ages up to and including the 5-year-old male class.

Mortality rates for female pups were increased from 40 percent to 45 percent and for males from 40 percent to 50 percent. Experience has shown that for all animals there is a greater death rate among young males than young females. It will be necessary to change mortality rates as new information regarding the life-history of seals is secured.

COMPLETE COMPUTATION

The following summary shows the methods used in computing the number of animals in the Pribilof Islands seal herd in 1938. It will be noted that the mortality rate for female pups was increased from 40 percent to 45 percent and for male pups from 40 percent to 50 percent. In addition, figures carried over from 1937 for yearling females and for all males up to 6 years of age were altered to provide for the newly applied mortality rates from the year the animals were born.

Complete computation of fur seals, Pribilof Islands, as of August 10, 1938

Class	St. Paul Island	St. George Island	Total
Pups, estimated	501,264	113,235	614,499
Breeding cows, 3 years old and over, by inference	501,264	113,235	614,499
Harem bulls, estimated	10,720	2,440	13,160
Idle bulls, estimated	1,787	338	2,125
Yearlings, male and female, estimated:			
Females born in 1937	232,067	52,424	284,491
Natural mortality, 45 percent	104,430	23,591	128,021
Yearling females, Aug. 10, 1938	127,637	28,833	156,470
Males born in 1937	232,067	52,424	284,491
Natural mortality, 50 percent	116,034	26,212	142,246
Yearling males beginning 1938	116,033	26,212	142,245
Yearling males killed in 1938	13	----------	13
Yearling males, Aug. 10, 1938	116,020	26,212	142,232
2-year-olds, male and female, estimated:			
Yearling females, Aug. 10, 1937 [1]	118,186	26,697	144,883
Natural mortality, 15 percent	17,728	4,005	21,733
2-year-old females, Aug. 10, 1938	100,458	22,692	123,150
Yearling males, Aug. 10, 1937 [1]	107,437	24,270	131,707
Natural mortality, 17.5 percent	18,801	4,247	23,048
2-year-old males beginning 1938	88,636	20,023	108,659
2-year-old males killed in 1938	1,431	225	1,656
2-year-old males, Aug. 10, 1938	87,205	19,798	107,003
3-year-old males, estimated:			
2-year-old males, Aug. 10, 1937 [1]	80,653	18,111	98,764
Natural mortality, 12.5 percent	10,082	2,264	12,346
3-year-old males beginning 1938	70,571	15,847	86,418
3-year-old males killed in 1938	42,864	11,276	54,140
3-year-old males, Aug. 10, 1938	27,707	4,571	32,278
4-year-old males, estimated:			
3-year-old males, Aug. 10, 1937 [1]	24,754	4,833	29,587
Natural mortality, 10 percent	2,475	483	2,958
4-year-old males beginning 1938	22,279	4,350	26,629
4-year-old males killed in 1938	1,642	712	2,354
4-year-old males, Aug. 10, 1938	20,637	3,638	24,275
5-year-old males, estimated:			
4-year-old males, Aug. 10, 1937 [1]	15,910	4,316	20,226
Natural mortality, 10 percent	1,591	432	2,023
5-year-old males beginning 1938	14,319	3,884	18,203
5-year-old males killed in 1938	2	----------	2
5-year-old males, Aug. 10, 1938	14,317	3,884	18,201
6-year-old males, estimated:			
5-year-old males, Aug. 10, 1937	18,567	3,019	21,586
Natural mortality, 20 percent	3,713	604	4,317
6-year-old males, Aug. 10, 1938	14,854	2,415	17,269

[1] It was found necessary to apply mortality rates of 45 percent for female pups and 50 percent for male pups, instead of 40 percent in each case, as formerly. Adjustments were made in the figures for 1937, therefore, to take care of these increased mortality rates for female pups and yearlings, and for males up to and including 5 years of age.

Complete computation of fur seals, Pribilof Islands, as of August 10, 1938—Con.

Class	St. Paul Island	St. George Island	Total
Surplus bulls, 7 years old and over, estimated:			
6-year-old males, Aug. 10, 1937	12,670	2,518	15,188
Natural mortality, 20 percent	2,534	504	3,038
7-year-old males, Aug. 10, 1938	10,136	2,014	12,150
Surplus bulls, Aug. 10, 1937	(1)	(1)	9,140
Natural mortality, 30 percent			2,742
Remaining surplus for 1938			6,398
Breeding bulls of 1937	13,205	2,926	16,131
Natural mortality, 30 percent	3,962	878	4,840
1937 bulls remaining in 1938	9,243	2,048	11,291
Breeding bulls of 1938	12,507	2,778	15,285
1937 bulls remaining, deducted	9,243	2,048	11,291
Increment of new bulls in 1938	3,264	730	3,994
7-year-old males computed for 1938	10,136	2,014	12,150
Surplus bulls computed for 1938			6,398
Total theoretical bull stock for 1938			18,548
New increment of breeding bulls deducted			3,994
Surplus bulls in 1938			14,554
50 percent deducted for losses due to natural causes and errors in loss percentages in previous years			7,277
Surplus bulls, Aug. 10, 1938			7,277

[1] Estimates have been worked out, insofar as possible, to show approximately the number of seals of each class which should be credited to each island. The seals, however, do not haul out in accordance with figures given. Seals born on either island frequent the other island. They travel promiscuously between the two islands and haul out on either one. The total for both islands, however, is approximately correct.

Recapitulation

Class	Total	Class	Total
Pups	614,499	5-year-old males	18,201
Cows	614,499	6-year-old males	17,269
Harem bulls	13,160	Surplus bulls	7,277
Idle bulls	2,125		
Yearling females	156,470	Total, 1938	1,872,438
Yearling males	142,232	Total, 1937	1,839,119
2-year-old females	123,150		
2-year-old males	107,003	Numerical increase, 1938	33,319
3-year-old males	32,278	Percent increase, 1938	1.81
4-year-old males	24,275		